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# Indian Educational Review

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Special Number

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# DPEP

*District  
Primary Education  
Programme*

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1995

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### *To Our Readers*

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## About This Issue

*The District Primary Education Programme (DPEP) is an effort to decentralise educational planning at the district level suiting the educational needs and demands of the particular district, with a view to achieving universal primary education, not only in terms of number and coverage, but also in terms of retention and attainment of the desired levels of learning by the children.*

*The District Primary Education Programme guidelines were formulated in April 1993 and since then there have been major developments in the evolution of DPEP. District projects were prepared in 42 districts spread over the seven states of Assam, Haryana, Madhya Pradesh, Karnataka, Maharashtra, Tamil Nadu and Kerala. A special feature had been the planning process in these districts, which has been intensive and participative; the process has cognated theory and practice with the involvement of various organisations. It would be a truism to say that DPEP planning processes have provided a valuable opportunity to field-test many of the pedagogical and management concepts that they have been developing over the years.*

*The research studies conducted as a part of the planning process have been of a path-breaking nature; and learning levels of over sixty thousand students were tested as part of a baseline study with rigorous sampling and pedagogic design, with a view to identify area-specific interventions in each of these districts. The loftiness of the objectives, the nature and intensity of the planning process, the integration of professional inputs, participative planning and management, and the emphasis on capacity building have together rendered DPEP an exciting idea not only in the country but all over the world.*

*This special number contains papers emanating out of the studies covering areas like pupil achievement; teacher motivation; factors affecting enrolment, retention and achievement of Scheduled Tribe students; effect of various intervention schemes on the education of Scheduled Tribes; status of inputs and facilities available for Scheduled Caste and Scheduled Tribe children, gender issues and State finances, etc.*

**Editors**

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# ***Acknowledgements***

The studies appearing in this special issue were carried out under DPEP research programme. The support for the following studies was provided by the Government of India, Ministry of Human Resource Development, Department of Education, District Primary Education Programme, through the Policy and Human Resource Development Fund of the Government of Japan, as administered by the World Bank:

1. Achievement difference and school effects
2. Effect of school variables on achievement gap between boys and girls
3. Effect of pupil and school level variables on the achievement of Scheduled Caste/Scheduled Tribe students
4. Effect of State interventions on pupils' achievement
5. Readability assessment of primary level textbooks.

The support for the following studies was provided by the Government of India, Ministry of Human Resource Development, Department of Education, District Primary Education Programme through the Policy and Human Resource Development Fund of the Government of Japan, as administered by the World Bank and UNICEF:

1. A study of the effect of household, community and school factors on the enrolment, retention and achievement of Scheduled Tribe children at primary level
2. Effectiveness of various interventions for improving tribal education
3. Educational problems of tribal children
4. Inputs in primary schools with different levels of concentration of Scheduled Tribe students
5. Gender issues in primary education.

The support for the following studies was provided by the Government of India, Ministry of Human Resource Development, Department of Education, District Primary Education Programme, through UNICEF.

1. Teacher policy, training needs and perceived status of teachers
2. Designing, production and distribution of instructional materials.

We gratefully acknowledge the support.

# Achievement Difference and School Effects

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## ABSTRACT

*This paper attempts to study the effects of school related variables on pupil's achievement using the data of Baseline Assessment Studies recently conducted in the eight states of India. Twenty-five indicators, both for pupil and school levels, are used in Hierarchical Linear Model separately for each state. The contribution of factors of teacher quality, school resources and school academic climate are studied after adjusting for pupil's background and school context variables. The eight states results are also synthesized. It is found that there exist gender and SC/ST gaps in achievement. Mother's and father's education and father's occupation are positively associated with the pupil's achievement. The school level factors of academic climate (test and feedback, homework, etc.) and teacher quality (teachers stay, teaching experience, etc.) are the prominent contributors as compared to those of school resources (educational and physical facilities).*

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## Introduction

Universalisation of Elementary Education being the national priority, the National Policy on Education, 1986 emphasised that new thrust in elementary education

will focus on three aspects: (i) universal access and enrolment, (ii) universal retention of children up to 14 years of age, and (iii) a substantial improvement in the quality of education to enable all children to achieve essential levels of learning. In order to achieve these, an array of micro-planning-based strategies are being formulated for application at the grassroot levels. One of them is the district specific planning to develop the educationally backward districts as envisaged in the Programme of Action 1992. In this direction, in 1993 a new initiative, viz., the District Primary Education Programme (DPEP) was taken.

### **The District Primary Education Programme**

The DPEP focussed on development of district specific plan by keeping in view the following parameters:

- (i) The emphasis on local area planning while formulating the district plans.
- (ii) Greater rigour and infusion of professional inputs in planning and appraisal.
- (iii) More focussed targeting on educationally backward districts with female literacy below national average and where Total Literacy Campaign has been successful.
- (iv) The coverage will be focussed on primary stage with stress on girls and socially disadvantaged groups

To begin with, the DPEP has been taken up in 44 districts in the states of Assam, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, and Tamil Nadu. As a part of the project formulation process, Baseline Assessment Studies (BAS) were undertaken to provide research based support to the district plans. The main thrust of the study was to assess the learning achievement of students approaching the end of primary school cycle, i.e., Class IV or V in reading (language) and mathematics based on Class III or IV curriculum as per the state pattern.

The present paper attempts to study the effects of school policies and practices on learner's achievement using the BAS data. The main objectives of this paper are to study

- (i) the variation in achievement in mathematics and language within and between schools;
- (ii) the effects of pupils' background on their mathematics and language achievement;
- (iii) the between schools variation in mathematics and language achievement after adjusting for student's background and school context;
- (iv) the effects of teacher quality on achievement in mathematics and language across schools;
- (v) the contribution to mathematics and language achievement between schools by the school resources;

- (vi) the association of school academic climate with the pupils' achievement between schools.

### Review of Related Literature

In India, Kulkarni (1970) conducted the first major study on achievement survey in mathematics covering the three levels of education, viz., end of primary (Class V), end of middle (Class VIII) and end of secondary stage (Class X) in 15 states. The number of students in the sample varied from more than 28,000 at primary level to nearly 20,000 at the secondary level. The major findings of the study for the primary level were: boys achieved higher than girls; the socio-economic conditions of the parents of school type (e.g., government or private management) provided better teaching-learning situations; and no relation was found between school achievement and teacher qualifications. This study was conducted about 29 years back (in 1966-67) and since then considerable changes have taken place in the Indian system of school education.

The *Fourth Survey of Research in Education 1983-88* (Buch, 1991) reported a few studies addressed to the achievement at the primary stage. Most of these (83 per cent) were doctoral studies. Besides, all were based on small samples and confining to a limited geographical area. The same pattern of researches continued as indicated in the *Fifth Survey of Educational Research and Innovations (1988-92)*—A *Bibliography* (Dave and Murthy, 1993).

Dave (1988) and his colleagues conducted an evaluation of achievement of primary school children studying in classes I to IV in 22 states/union territories in India. Although the main objective of the study was to compare the impact of inputs of the special project, 'Primary Education Curriculum Renewal', it also had samples of pupils from non-project schools varying from 1800 in class I to less than 200 in class IV. Large differences between states were observed in this study as well.

Recently, Shukla (1994) conducted another study to find out the level of attainment of primary school children in various states in India. A sample of about 66,000 students (studied up to grade IV) was covered for 25 states and the union territory of Delhi. These students were administered an Arithmetic Test and a reading Comprehension Test. The study revealed that over the states, the difference between the mean achievement of boys and girls did not have the same direction. In some states boys did better than girls whereas in some other states girls did better than boys. For the entire country the SC/ST pupils performed lower than the non-SC/ST ones. Further, the pupil's achievement was found to be positively related with father's education, facility for learning and educational environment at home. The variables related to schools and teachers indicated somewhat weak relationship with achievement.

Jangira (1994), while synthesizing the results of BAS of the eight DPEP states, found that students performed low in reading as well in mathematics. There was a marked difference in achievement across schools as well across states. With the help of regression analysis, a few individual and group level variables were found as significant predictors. The individual level predictors for language achievement were : educational and occupational aspiration; teacher coming to class regularly; TV-watching; receiving dictation and feedback on tests; opportunity to read material other than textbooks; language of instruction and difficulty in understanding teacher's language in the classroom; availability of language textbook. For prediction of mathematics achievement, the individual level variables were : father's education, reading other material, correcting homework regularly, educational and occupational aspirations, and understanding teacher's language. The group level predictors, viz., asking children to read from textbook on their own and reading from the textbook and explaining were predictors for language achievement. For mathematics achievement, class size and teacher's expectations were found to be the significant predictors. The variables identified at individual as well at group level for mathematics and language did not indicate any consistent behaviour.

It can be summarised from the findings of the above studies that there was no consistency of pattern in relationships between the achievement and pupil and school related variables. However, the achievement differed widely not only between schools but also over the states. It is, therefore important to study the school related variables having effects on learner's achievement.

### Data and Methods

The data collected under BAS were used in this study. The 44 DPEP target districts, having female literacy below the national average, were selected from eight states. About 20 per cent of rural blocks and urban areas identified in 1991 census were randomly selected. Wherever tribal block did not appear in the selection one tribal block was added to the sample. Further, 35-45 primary schools were randomly selected from each district on the basis of proportionate allocation considering the rural and urban population. Up to 30 all Class IV or V students, and in case of more than 30, only 30 students were randomly selected. Students of Class V were selected in the states of Haryana, Madhya Pradesh, Orissa and Tamil Nadu; and students of Class IV were selected in Assam, Kerala, Karnataka, and Maharashtra. Up to 5 teachers including the head teacher all, and if the number exceeded 5, five teachers were randomly selected. Following this procedure, the data relating to 1,746 schools, 23,700 students and 4,879 teachers were finally included in the analysis. The state-wise details are given in Table 1.

TABLE 1  
State-wise Sample of Districts, Schools, Teachers and Students

<i>State</i>	<i>Districts</i>	<i>Schools</i>	<i>Teachers</i>	<i>Pupils</i>
Assam	04	161	439	1706
Haryana	04	144	531	2489
Karnataka	04	176	437	2568
Kerala	03	113	502	3089
Madhya Pradesh	18	733	1701	8010
Maharashtra	09	135	409	2143
Orissa	04	165	515	1364
Tamil Nadu	03	119	345	2323
Total	43*	1746	4879	23700

\* One district data of Madhya Pradesh are excluded due to non-availability of achievement scores on language.

Students of Class V were administered the standardized tests on mathematics (40 items) and reading (84 items). For students of Class IV the tests in mathematics and reading had 40 and 44 items respectively. In addition to the achievement scores other information related to pupil, school and teacher were collected through the structured interview schedules, namely, Student (Present) Schedule (SS), School Record Schedule (SRS) and Teacher Schedule (TS).

In all twenty-five indicators consisting of six at the pupil-level and nineteen at school-level were developed. In addition to these, two variables, viz., mean SES and per cent SC/ST at school-level were also included as school intake composition. The scores in mathematics and language were standardised with mean zero and standard deviation one. The details about indicators are given in Appendix A. Further, the state-wise basic statistics, viz., mean and standard deviation for each indicator are given in Appendix B.

A multilevel regression analysis fits a hierarchical linear model (HLM) to data that are organized hierarchically (Bryk & Raudenbush, 1992); in this case students are nested within schools. It enables the researcher to partition the variation in a variable into within and between schools, and to examine the relationships among variables both within and among schools. The first HLM analysis called a null model because it does not include any student background co-variate, provide the variation within and between schools. The standardised scores in mathematics and language were independently included for the purpose. Then, the pupil's background variables are included to explain the within as well between school variation. The student background variables which did not

indicate significant variation across schools were constrained. The reduction in the within as well between school variance for pupil's background variables also provide the adjusted school means.

The mean SES and per cent SC/ST of the school are considered important as the intake composition of a school, which can have a "contextual effect" on student achievement over and above the individual characteristics. These two variables were included in the analysis for further adjustments of the school means.

The three sets of school level variables were included in the HLM analysis independently after adjusting for the pupil's background and contextual variables. This approach was adopted for all the eight states. In order to have synthesis of the state results the regression coefficients and their standard errors with probability level less than 0.20 for each variable was taken for applying meta-analysis with the help of HLM computer programme.

## Results

### EFFECTS OF PUPIL'S BACKGROUND VARIABLES

The variation within and between schools before and after adjusting for pupil's background variables for mathematics and language in respect of all the eight states are given in Table 2. The achievement in mathematics varies substantially

TABLE 2  
Unadjusted and Adjusted Within and Between School Variances for Pupil's Background in Mathematics and Language

Variance	Assam	Haryana	Karnataka	Kerala	M.P.	Maharashtra	Orissa	Tamil Nadu
Mathematics — Unadjusted for Pupil's Background								
Between School	48.3	31.3	60.6	19.6	45.6	39.3	44.1	36.0
Within School	51.7	68.7	39.4	80.4	54.4	60.7	55.9	64.0
Mathematics — Adjusted for Pupil's Background								
Between School	44.8	27.1	53.6	19.6	42.6	35.6	40.4	31.1
Within School	43.7	62.0	32.6	69.0	50.5	42.5	52.5	56.8
Language — Unadjusted for Pupil's Background								
Between School	35.0	35.6	45.2	13.7	45.4	37.7	29.3	32.8
Within School	65.0	64.4	54.8	86.3	54.6	62.3	70.7	67.2
Language — Adjusted for Pupil's Background								
Between School	30.6	32.4	37.8	14.7	42.4	32.4	25.7	30.3
Within School	55.8	59.5	39.8	74.9	48.8	47.1	65.6	56.1



within schools from the highest 80.4 per cent in Kerala to the lowest 39.4 per cent for Karnataka. In language the corresponding position is 86.3 per cent for Kerala and 54.8 per cent for Karnataka. It indicates that the variances in achievement within schools are substantial and they vary across states. Mostly the within schools variances are uniformly lower in mathematics than the language.

The variation in achievement between schools for mathematics and language for each state are statistically significant. These variances also vary across states. Kerala indicates the lowest percentage for variances for both mathematics (19.6 per cent) and language (13.7 per cent); the highest percentage of variance between schools for mathematics is in Karnataka (60.6 per cent) and for language 45.4 per cent in Madhya Pradesh. However, these variations are uniformly lower in language as compared to mathematics.

The within schools variances adjusted for pupil's background are reduced substantially for mathematics, ranging from 6.1 to 29.7 per cent, and the reduction for language is ranging from 7.3 to 28.8 per cent. Similarly, the reduction in variances between schools for mathematics and language are ranging from 1.7 to 13.6 per cent and 6.6 to 16.4 per cent respectively with the exception of Kerala state having no such reduction.

#### EFFECTS OF PUPIL'S BACKGROUND AND SCHOOL CONTEXT VARIABLES

The effects of pupil-level variables on mathematics and language are given in Table 3 and Table 4 respectively. They also include the effects of school intake composition.

The results show that there are large and statistically significant differences between boys and girls within schools in their achievement in mathematics in the states of Assam, Haryana, Karnataka, Madhya Pradesh and Orissa. These differences are also found statistically significant in language achievement for all the states except Haryana and Kerala. These differences vary significantly among schools in all the states. Mostly the gender differences are greater in mathematics than in language.

There are large and statistically significant gap in mathematics achievement of SC/ST and non-SC/ST students with the exception of Haryana, Orissa and Tamil Nadu. In language achievement the gap was significant in Haryana, Kerala and Madhya Pradesh. However, in most states these do not vary significantly among schools. Karnataka and Kerala are the two exceptions in language achievement.

Father's education within schools has shown a positive and highly significant association with pupil's achievement in mathematics and language in all the states except Karnataka, Maharashtra and Tamil Nadu for mathematics, and Haryana for language. Similarly, the mother's education has displayed highly significant

# ACHIEVEMENT DIFFERENCE AND SCHOOL EFFECTS

TABLE 3

*Effects of Pupil's Background and Context Variables on Achievement in Mathematics*

<i>Variance</i>	<i>Assam</i>	<i>Har- yana</i>	<i>Karna- taka</i>	<i>Kerala</i>	<i>M.P.</i>	<i>Maha- rashtra</i>	<i>Orissa</i>	<i>Tamil Nadu</i>
	<i>Coef. (SE)</i>	<i>Coef. (SE)</i>	<i>Coef. (SE)</i>	<i>Coef. (SE)</i>	<i>Coef. (SE)</i>	<i>Coef. (SE)</i>	<i>Coef. (SE)</i>	<i>Coef. (SE)</i>
School Mean	-.085 (.059)	-.015 (.048)	-.044 (.060)	.012 (.042)	-.067 ** (.027)	-.019 (.060)	-.115* (.057)	-.053 (.056)
Mean SES	.139 (.122)	.110 (.104)	.049 (.118)	.288* (.119)	.178** (.055)	.380** (.115)	.248* (.108)	.180 (.139)
Per cent SC/ST	-.001 (.002)	-.004* (.002)	-.003 (.003)	.014** (.003)	.000 (.001)	.002 (.002)	-.001 (.002)	-.001 (.002)
Gender gap	-.130** (.048)	-.232** (.052)	-.108* (.044)	-.063 (.045)	-.178** (.025)	-.058 (.063)	-.150** (.054)	-.043 (.049)
SC/ST gap	-.047 (.069)	-.093* (.045)	-.085** (.033)	-.272** (.055)	-.060** (.023)	-.082* (.041)	-.066 (.056)	-.016 (.048)
Father's Education	.081** (.020)	.045* (.019)	.019 (.015)	.043* (.018)	.045** (.010)	.008 (.019)	.071** (.026)	.072 (.019)
Mother's Education	.083** (.022)	.038* (.019)	.060** (.015)	.063** (.018)	.034** (.010)	.052** (.019)	.080** (.027)	.033** (.019)
Father's Occupation	.034* (.016)	.035* (.018)	.041** (.014)	.111** (.017)	.035** (.009)	.052** (.019)	.050* (.025)	.030 (.018)
Repeater	-.161** (.039)	-.240** (.037)	-.038 (.033)	-.339** (.039)	-.123** (.020)	-.099** (.038)	-.175** (.049)	-.076* (.039)
<i>Residual Variances</i>								
School Mean	.466**	.272**	.583**	.169**	.431**	.416**	.396**	.333**
Gender gap	.121**	.112**	.151**	.119**	.071**	.278**	.076*	.129**
Pupil scores	.457	.642	.354	.722	.517	.533	.544	.609

\* P<.05 \*\* P<.01

# ACHIEVEMENT DIFFERENCE AND SCHOOL EFFECTS

TABLE 4

Effect of Pupil's Background and Context Variables on Achievement in Language

Variance	Assam	Har- yana	Karna- taka	Kerala	M P.	Maha- rashtra	Orissa	Tamil Nadu
	Coef (SE)	Coef (SE)	Coef (SE)	Coef. (SE)	Coef' (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)
School Mean	-.063 (.051)	-.004 (.052)	-.044 (.053)	.014 (.034)	-.065* (.027)	-.029 (.056)	-.089 (.049)	-.023 (.056)
Mean SES	.072 (.104)	.135 (.109)	.234* (.102)	.249** (.097)	.222** (.055)	.300** (.109)	.163 (.095)	-.045 (.138)
Per cent SC/ST	-.003 (.002)	-.000 (.002)	-.005* (.002)	-.016** (.002)	-.001 (.001)	-.001 (.002)	-.001 (.002)	-.002 (.002)
Gender gap	-.128** (.052)	.070 (.048)	-.105* (.048)	.008 (.039)	-.197** (.025)	-.156** (.060)	-.156** (.059)	-.117* (.051)
SC/ST gap	.054 (.078)	.113** (.044)	-.040 (.050)	-.406** (.073)	-.074** (.022)	.013 (.042)	-.062 (.062)	-.076 (.049)
Father's Education	.065** (.023)	.029 (.019)	.048** (.018)	.071** (.018)	.058** (.010)	.059** (.019)	.074** (.029)	.071** (.019)
Mother's Education	.074** (.023)	.062** (.019)	.033 (.017)	.097** (.018)	.040** (.010)	.073** (.019)	.129** (.029)	.013 (.019)
Father's Occupation	.034 (.018)	.038* (.018)	.032* (.016)	.124** (.017)	.032** (.009)	.027 (.019)	.066** (.027)	.063** (.018)
Repeater	-.209** (.043)	.216** (.036)	-.090* (.038)	-.428** (.040)	-.147** (.020)	-.156** (.039)	-.301** (.053)	-.198** (.040)
<i>Residual Variances</i>								
School Means	.315**	.334**	.438**	.103**	.434**	.359**	.241**	.334**
Gender gap	.138**	.085**	.157**	.060**	.088**	.242**	.095*	.148**
SC/ST gap	—	—	.106**	.141**	—	—	—	—
Pupil Scores	.586	.610	.491	.737	.510	.549	.646	.615

\*  $p < .05$  \*\*  $p < .01$

association with achievement except Tamil Nadu for mathematics, and Karnataka and Tamil Nadu for language. A similar behaviour within schools is observed for father's occupation with achievement with the exception of Tamil Nadu for mathematics, and Assam and Maharashtra for language.

# ACHIEVEMENT DIFFERENCE AND SCHOOL EFFECTS

TABLE 3

*Effects of Pupil's Background and Context Variables on Achievement in Mathematics*

<i>Variance</i>	<i>Assam</i>	<i>Haryana</i>	<i>Karnataka</i>	<i>Kerala</i>	<i>M.P.</i>	<i>Maharashtra</i>	<i>Orissa</i>	<i>Tamil Nadu</i>
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Mean SES	.139 (.122)	.110 (.104)	.049 (.118)	.288* (.119)	.178** (.055)	.380** (.115)	.248* (.108)	.180 (.139)
Per cent SC/ST	-.001 (.002)	-.004* (.002)	-.003 (.003)	.014** (.003)	.000 (.001)	.002 (.002)	-.001 (.002)	-.001 (.002)
Gender gap	-.130** (.048)	-.232** (.052)	-.108* (.044)	-.063 (.045)	-.178** (.025)	-.058 (.063)	-.150** (.054)	-.043 (.049)
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\* P<.05 \*\* P<.01

# ACHIEVEMENT DIFFERENCE AND SCHOOL EFFECTS

TABLE 4

## Effect of Pupil's Background and Context Variables on Achievement in Language

<i>Variance</i>	<i>Assam</i>	<i>Haryana</i>	<i>Karnataka</i>	<i>Kerala</i>	<i>M P.</i>	<i>Maharashtra</i>	<i>Orissa</i>	<i>Tamil Nadu</i>
	<i>Coef (SE)</i>	<i>Coef (SE)</i>	<i>Coef (SE)</i>	<i>Coef (SE)</i>	<i>Coef (SE)</i>	<i>Coef (SE)</i>	<i>Coef (SE)</i>	<i>Coef (SE)</i>
School Mean	-.063 (.051)	-.004 (.052)	-.044 (.053)	.014 (.034)	-.065* (.027)	-.029 (.056)	-.089 (.049)	-.023 (.056)
Mean SES	.072 (.104)	.135 (.109)	.234* (.102)	.249** (.097)	.222** (.055)	.300** (.109)	.163 (.095)	-.045 (.138)
Per cent SC/ST	-.003 (.002)	-.000 (.002)	-.005* (.002)	-.016** (.002)	-.001 (.001)	-.001 (.002)	-.001 (.002)	-.002 (.002)
Gender gap	-.128** (.052)	.070 (.048)	-.105* (.048)	.008 (.039)	-.197** (.025)	-.156** (.060)	-.156** (.059)	-.117* (.051)
SC/ST gap	.054 (.078)	.113** (.044)	-.040 (.050)	-.406** (.073)	-.074** (.022)	.013 (.042)	-.062 (.062)	-.076 (.049)
Father's Education	.065** (.023)	.029 (.019)	.048** (.018)	.071** (.018)	.058** (.010)	.059** (.019)	.074** (.029)	.071** (.019)
Mother's Education	.074** (.023)	.062** (.019)	.033 (.017)	.097** (.018)	.040** (.010)	.073** (.019)	.129** (.029)	.013 (.019)
Father's Occupation	.034 (.018)	.038* (.018)	.032* (.016)	.124** (.017)	.032** (.009)	.027 (.019)	.066** (.027)	.063** (.018)
Repeater	-.209** (.043)	.216** (.036)	-.090* (.038)	-.428** (.040)	-.147** (.020)	-.156** (.039)	-.301** (.053)	-.198** (.040)
<i>Residual Variances</i>								
School Means	.315**	.334**	.438**	.103**	.434**	.359**	.241**	.334**
Gender gap	.138**	.085**	.157**	.060**	.088**	.242**	.095*	.148**
SC/ST gap	—	—	.106**	.141**	—	—	—	—
Pupil Scores	.586	.610	.491	.737	.510	.549	.646	.615

\*  $p < .05$  \*\*  $p < .01$

association with achievement except Tamil Nadu for mathematics, and Karnataka and Tamil Nadu for language. A similar behaviour within schools is observed for father's occupation with achievement with the exception of Tamil Nadu for mathematics, and Assam and Maharashtra for language.

The differences between pupils who have repeated one or more grades, and those who have not, are large and statistically significant. The size of this difference does not vary significantly among schools within each state; however, the differences are consistent across states.

At the school level the mean-SES is positively associated with the achievement in mathematics and language after adjusting for pupil's background. This association is statistically significant in four out of eight states. The association of per cent SC/ST in school with achievement is not consistent across states. In Kerala the association is positive and highly significant whereas in Haryana for mathematics and Karnataka for language the association is negative and also statistically significant.

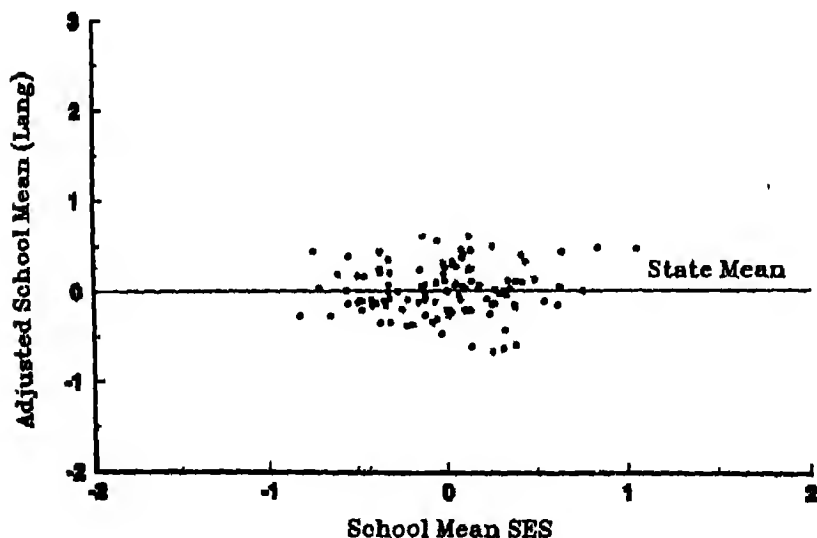


FIG. 1 Adjusted school language mean SES  
State—Kerala

The school means after adjusting for pupil's background and contextual effects are shown graphically to discern the differences between schools. Figure 1 represents the state of Kerala with lowest between school variance in language. On the contrary Figure 2 represents the schools of Karnataka having highest between school variance in mathematics.

# ACHIEVEMENT DIFFERENCE AND SCHOOL EFFECTS

TABLE 5

## Effects of School Level Variables — Teacher Quality

Variance	Assam	Har- yana	Karna- taka	Kerala	M.P.	Maha- rashtra	Orissa	Tamil Nadu
	Coef (SE)	Coef (SE)	Coef (SE)	Coef. (SE)	Coef (SE)	Coef (SE)	Coef. (SE)	Coef. (SE)
<b>MATHEMATICS</b>								
Teacher Quality	.124** (.048)	.074 (.053)		-.157** 061		-.110* (.047)		.056 (.047)
Teacher Experience				-.023* (.010)	-.006 (.004)			-.014 (.009)
Inservice		.245 (.134)	-.343* (.153)		.124 (.071)			-.008 (.006)
Stay Period		-.026 (.016)	.021 (.015)		.015* (.006)		.029 (.018)	.021 (.011)
<b>LANGUAGE</b>								
Teacher Quality	.083* (.042)			-.116* (.050)	-.039* (.018)	-.068 (.045)	.068 (.037)	.097* (.049)
Teacher Experience				-.021** (.008)	-.008 (.004)		-.016 (.009)	
Inservice	-.315* (.153)	.256 (.141)	-.208 (.135)		.098 (.072)			
Stay Period				.011 (.007)	.010 (.006)		.027 (.016)	.024* (.011)

## (ii) EFFECTS OF SCHOOL RESOURCES

Out of seven factors of school resources only four factors have indicated association with school mean achievement both in mathematics and language. These factors are educational facility, physical facility, number of teachers in the school, and pupil-teacher ratio. However, their relationships are at variance among stages. Educational and physical facilities have quite stable and significant positive association with the mean achievement in mathematics. If educational facilities are increased by one unit, on average, the school mean achievement in mathematics tends to increase by about 3 per cent of the standard deviation. Whereas, the increase would be about 4.5 per cent of the standard deviation if the physical facilities in the school are increased by one unit. The number of teachers and pupil-teacher ratio have displayed negative association with the school mean achievement. The meta analysis has, however, provided these relationships as not significant statistically.

Figure 4 represents the schools of Madhya Pradesh with their means in mathematics (adjusted for pupil's background and school context) in relation to

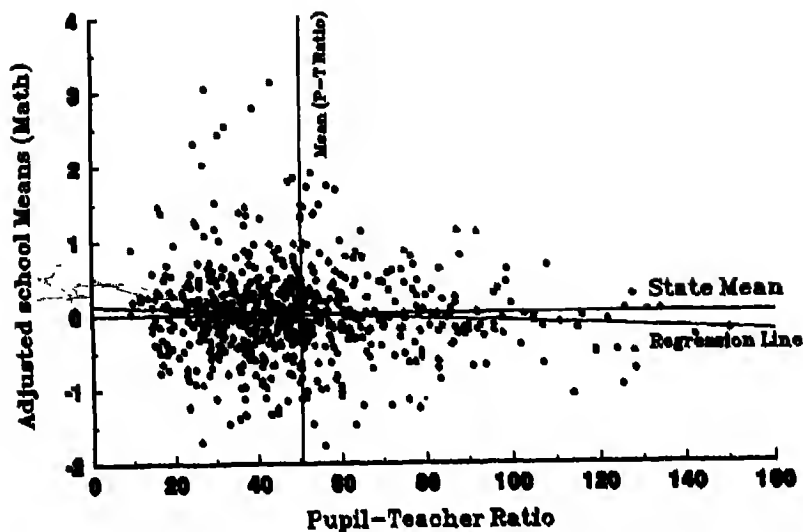


FIG 4 Adjusted school means in Mathematics with pupil-teacher ratio  
State—Madhya Pradesh

pupil-teacher ratio. The graph shows that the pupil-teacher ratio up to 50 provide the average of school means near to the aggregate mean and starts declining thereafter,

### (iii) EFFECTS OF SCHOOL ACADEMIC CLIMATE

All the seven factors of the school academic climate have displayed statistically significant association with school mean achievement except for head teacher leadership in mathematics. The contribution of each factor is not uniform across states. The synthesis of all the results shows that the two factors, viz., teacher frequently taking test and providing feedback, and teacher assigning homework and correcting, are positively associated with the mathematics and language school mean achievements. It may be observed that the contribution of the former factor is 21 per cent and 18 per cent of the standard deviation to the mathematics and language achievement respectively. Whereas the corresponding contribution of the latter is 30 per cent and 25 per cent of the standard deviation.

The time devoted for doing the homework by pupils has indicated positive and statistically significant contribution at 1 per cent in language. Increase by 1



## ACHIEVEMENT DIFFERENCE AND SCHOOL EFFECTS

TABLE 6

## Effects of School Level Variables-School Resources

Variance	Assam	Haryana	Karnataka	Kerala	M.P.	Maharashtra	Orissa	Tamil Nadu
	Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)
<b>MATHEMATICS</b>								
Educational Facility	.027 (.019)			.031* (.013)	.025* (.012)			
Physical Facility			.092** (.024)		.029** (.011)		.059** (.022)	
No. of Teachers			-.056* (.027)	-.013 (.007)				
P-T Ratio				-.037 (.023)	-.022* (.001)	-.006 (.004)	.007 (.004)	
Per cent Female Teachers							-.171 (.136)	
<b>LANGUAGE</b>								
Educational Facility					.014* (.007)	-.036* (.016)	-.029 (.016)	
Physical Facility	-.026 (.027)		.065** (.022)		.028** (.011)		.060** (.021)	
No. of Teachers			-.051* (.025)	-.010 (.006)				.049* (.025)
Pupil-Teacher Ratio				-.021 (.020)	-.004* (.001)			.003 (.002)
Primary								.003 (.002)
Per cent Female Teachers					.003 (.002)			

\*  $p < .05$  \*\*  $p < .01$ 

unit of the activity by an average student would result into increase in achievement by 10 per cent of the standard deviation.

The factor, teacher gives arithmetic problems to solve in the class regularly, contributes significantly at 1 per cent level to the mathematics school mean achievement. It implies that a unit increase in the frequency of this activity tends to enhance mean school achievement by 32 per cent of the standard deviation.

Teacher commitment is positively associated for mathematics in Maharashtra and for language in Haryana, Madhya Pradesh and Maharashtra. In the state of Assam this association is however negative. Parent involvement has positive association with both the subjects in one state each. Head teacher as leader is positively associated in language in Assam only. On synthesis, these results across states become weak and unstable.

# ACHIEVEMENT DIFFERENCE AND SCHOOL EFFECTS

TABLE 7

## Effects of School Level Variables – School Academic Climate

Variance	Assam	Har- yana	Karna- taka	Kerala	M P.	Maha- rashtra	Orissa	Tamil Nadu
	Coef (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef (SE)	Coef. (SE)	Coef. (SE)
<b>MATHEMATICS</b>								
Arithmetic Problems	.729* (.197)	.350** (.139)		.373** (.150)	.197** (.064)			.189 (.164)
Test feed back			.327** (.087)	.161* (.072)	.196** (.040)			
Teachers give HW	.362 (.194)					.465* (.200)	.429** (.146)	.162* (.069)
Pupils do HW	.069 (.048)			.262** (.089)				
Teacher commitment	.345** (.109)					.279* (.127)		
Parent involvement		-.111 (.062)	.117* (.061)					
Head teacher as leader						-.133 (.091)	.150 (.100)	
<b>LANGUAGE</b>								
Reading and dictation			.367** (.127)		-.245** (.091)			.496* (.237)
Test feedback				.165* (.070)	.189** (.042)			
Teachers give HW	.421* (.174)				.194* (.084)	.433* (.186)	.416** (.129)	-.226 (.185)
Pupils do HW	.079* (.041)	.121** (.047)						
Teacher commitment	-.203* (.088)	.203** (.075)		-.121 (.079)	.105* (.052)	.295** (.119)		
Parent involvement			.103 (.054)	.168* (.077)	-.031 (.026)			
Head teacher as leader	.279** (.108)					-.134 (.086)		

\*  $p < .05$  \*\*  $p < .01$

## Summary and Discussion

The results are based on BAS data from 43 educationally backward DPEP districts of the eight states covering 1,746 primary schools, 4,879 teachers and 23,700 students. It may be noted that these eight states differ substantially with respect

## (ii) EFFECTS OF SCHOOL RESOURCES

The factors of educational and physical facilities in schools have positive association with school mean achievement in mathematics. These associations are mostly consistent across states. The number of teacher and pupil-teacher ratio have negative association with achievement.

The results suggest that the conditions of schools which are not properly equipped with the minimum basic physical and educational facilities may be considered for improvement on priority. Also optimum number of teachers or appropriate pupil-teacher ratio may be helpful in improving the achievement level.

## (iii) EFFECTS OF SCHOOL ACADEMIC CLIMATE

The synthesis of the results of all the eight states shows two factors, viz., teacher frequently taking test and providing feedback, and teacher assigning homework and correcting, have positive and strong association with school means in mathematics and language. The third factor, viz., time devoted by pupil for doing the homework has indicated positive contribution in language. The fourth factor, namely, teacher frequently give arithmetic problems to solve in the class, contributes significantly to the mathematics school mean. The remaining factors, viz., teacher commitment, parent involvement and head teacher as leader have shown positive association in some of the states.

The results suggest that the suitable classroom teaching strategies may be developed with inbuilt test and feedback, assigning homework and correction, etc. Other important aspects to improve the climate are teacher commitment, effective leadership of head teacher and parent involvement.

It may be mentioned that the BAS data for school-level variables describing policies and practices are rather weak. The first reason is that the study was not designed the way the constructs could have been measured in sufficient detail in order to provide powerful estimates of the effects; secondly the data do not allow for the matching of students and teachers. Thus, the estimate of variables of teacher quality effects are based on the average of all teachers in the school rather than on the teacher(s) who was most recently teaching a given student. Therefore, the effect size of these variables are underestimated.

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# ACHIEVEMENT DIFFERENCE AND SCHOOL EFFECTS

## APPENDIX A

### Indicators at Pupil and School Levels

<i>Sl. No.</i>	<i>Label (Schedule and Q. No.)</i>	<i>Indicator description</i>	<i>Construction of Indicator</i>
<b>I. Pupil's Background Variable</b>			
1.	GIRL (SS3)	Gender	Girl = 1, Boy = 0 centred at pupil level
2.	SCST (SS6)	Caste	SC or ST = 1, Non-SCST = 0 centred at pupil level
3.	DADED (SS 9)	Father education	Applied Logit
4.	MUMED (SS 9)	Mother education	Applied Logit
5.	DADOC (SS 10)	Father occupation	Unskilled worker = 1; Poultry farming = 2; Picking forest produce = 3, Agri. labourer = 4; Farmer = 5, Skilled worker = 6; Street vendor = 7; Others = 8; Self employed = 9; Domestic servant = 10; Household = 11; Clerk = 12; Employer = 13; Senior officer = 14) Applied Logit
6.	REPEAT	Ever repeated a class	Repeat = 1 If yes in any class Else = 0 Centred at Pupil Level
7.	SES	Socio-economic status	SES = (DADED + MMUMED + DADOC)/Valid responses Composite and standardised
<b>II Contextual Variables</b>			
1.	MEANSES	School Mean SES	Aggregated from pupil to school level Centred at School Level
2.	PCTSCST	Per cent SCST	Per cent of SC and ST in the school Centred at School Level
<b>III Teacher's Quality Variables</b>			
1.	TCHQUA (TS 4)	Qualification	Class VIII = 8, class X = 10, class XI/XII = 12, graduate = 14, post graduate = 16) Aggregated & centered at school level
2.	TCHEXP (TS 10B)	Experience	1993- yr. of first appointment Aggregated & centered at school level
3.	INSERVICE (TS 13)	Inservice training	INSERVICE = 1, if received during last 3 years
4.	STABLE (TS 10C)	Period in present school	Aggregated & centered at school level Subtracted year of appointment from 1993 Aggregated and centered at school level
<b>IV Resource Variables</b>			
1.	MATERIAL (TS 20A 21A1-A9)	Access to teaching material	Add all "yes = 1" Aggregated and centered at school level
2.	FACLED (SRS 22 (1-9, 15, 16))	Instructional Material available	Add all "yes = 1" Aggregated and centered at school level

# ACHIEVEMENT DIFFERENCE AND SCHOOL EFFECTS

Sl. No.	Label (Schedule and Q No.)	Indicator description	Construction of Indicator
3.	FACILPH (SRS 22 (10, 12-14, 18-27))	Physical facility	Add all "yes = 1" Aggregated and centered at school level
4.	NUMTCH (SRS 9)	No. of teachers	Total of male & female teachers for 1993-94 Centered at school level
5.	PTRATIO (SRS 6C)	Pupil teacher Ratio	Total enrolment of classes I-V/ Numtch Centered at school level
6.	PRIMARY (SRS 3)	Primary and Extended Primary	Primary = 1 for classes I-IV/V, Else = 0 Centered at school level
7.	PCTPEMT (SRS 9)	Percent female teachers	Female teachers* 100/Numtch Centered at school level
<b>V Climate of School</b>			
1.	PRESSLING (SS 30,32)	Academic Press in language	Teachers ask to read & give dictation in class Never = 0, Sometimes = 1, Everyday = 2, Average valid responses, Agg. centered at school level
2.	PRESSMTH (SS 33)	Academic press in Math	Teacher give arith. problems to solve in class Never = 0, Sometimes = 1, Everyday = 2, Aggregated & centered at school level
3.	PRESSTST (SS 34)	Academic Press test & feedback	Teacher give test and feedback to students For test-never = 1, once a while = 2, once in a year = 3, once in a term = 4, once in a month = 5, once in a week = 6; For feedback-not applicable = 1, never = 2, sometimes = 3, always = 4 Average by valid response after using Logit Aggregated & centered at school level
4.	PRESSTHW (SS 35A, C)	Academic press teacher give home work	Teacher assign and correct home work Never = 0, Sometimes = 1, Always/regularly = 2) Average by valid responses, aggregated & centered at school level
5.	PRESSPHW (SS 35B)	Academic Press Pupil doing Homework	No & do not do HW = 0, less than 30 min. = 1, 30-60 mins - 2, 61 = 120 = 3, over 120 min = 4. Aggregated & centered at school level
6.	COMMIT (SS 29A, 36)	Teacher commitment	Teacher comes to class-Rarely = 1, Sometimes = 2, most of the days = 3, Teacher provide, special help-Never = 1, Sometimes = 2, Always = 4 Average by valid responses after Logit. Aggregated & centered at school level
7.	PRNTINV (TS 30C, D)	Parent Involvement	Parent-teacher meeting, meeting parents, Never = 0, Once in year = 1, Once in term = 2, Once in a month = 3, Once in a week = 4 Average by valid responses, Aggregated & centered at school level

# ACHIEVEMENT DIFFERENCE AND SCHOOL EFFECTS

<i>Sl. No</i>	<i>Label (Schedule and Q. No.)</i>	<i>Indicator description</i>	<i>Construction of Indicator</i>
8	HMLEADER (TS 30A, B)	Head teacher as leader	Reviewing the performance of his/her class and all classes-Never = 0, Once in year = 1, Once in a term = 2, Once in a month = 3, Once in a week = 4 Average by valid responses, Aggregated & centered at school level

# Annex B

State-wise Mean and S.D.

Variable	Assam		Bihar		Karnataka		Kerala		Madhya Pradesh		Maharashtra		Orissa		Tamil Nadu	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Student Level Variables																
MATH	19.87	7.95	15.50	5.40	15.58	7.82	14.89	5.67	11.23	5.31	11.67	6.49	14.61	6.61	11.27	4.65
LANG	21.23	7.89	37.10	1.48	16.34	7.23	20.68	8.11	28.68	14.69	16.60	8.38	34.85	12.91	30.53	10.88
School Level Variables																
GRUL	.48	.50	.49	.50	.40	.49	.48	.50	.43	.50	.44	.50	.37	.48	.46	.50
SCST	.34	.43	.34	.43	.23	.42	.11	.32	.26	.44	.35	.48	.38	.49	.27	.44
DADIED	.00	1.00	.00	1.00	.00	1.00	.00	1.00	.00	1.00	.00	1.00	.00	1.00	.00	1.00
MUMED	.00	1.00	.00	1.00	.00	1.00	.00	1.00	.00	1.00	.00	1.00	.00	1.00	.00	1.00
DADDOC	.00	1.00	.00	1.00	.00	1.00	.00	1.00	.00	1.00	.00	1.00	.00	1.00	.00	1.00
REPEAT	.37	.46	.33	.47	.23	.42	.21	.41	.31	.46	.31	.46	.31	.46	.31	.46
SES	.00	.79	.00	.73	.00	.75	.00	.67	.00	.74	.00	.74	.00	.77	.00	.71

## School Level Variables

MEANSSES	-17	.54	-03	.49	-14	.55	.00	.36	-18	-.53	-16	.53	-23	.66	-04	.39
PCTSCST	33.19	42.00	25.38	24.52	28.30	25.74	11.41	14.44	30.68	29.93	37.53	32.05	48.23	37.15	26.77	30.03
TECHQUAL	9.95	1.23	10.73	.92	11.37	1.40	11.47	.80	12.55	1.60	11.07	1.26	11.68	1.40	11.73	1.23
TOCHEXP	15.18	7.50	16.69	7.49	12.31	8.42	13.97	4.91	16.24	8.46	14.94	8.44	14.39	6.50	20.47	7.15



Variable	Assam		Bihar		Karnataka		Kerala		Madhya Pradesh		Maharashtra		Orissa		Tamil Nadu	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
INSERVIC	.31	.33	.64	.36	.55	.39	.68	.27	.52	.40	.64	.36	.43	.31	.72	.31
STABLE	7.60	5.53	3.87	3.07	4.82	4.04	8.03	5.29	7.51	5.10	5.29	4.68	4.67	3.28	7.59	5.34
MATERIAL	3.41	2.47	5.97	2.07	6.70	2.12	5.93	1.99	4.73	3.07	6.54	2.05	8.15	1.76	7.93	1.93
FACILED	4.35	3.20	8.68	3.08	8.92	3.56	5.80	3.17	6.55	4.47	7.87	3.28	10.22	3.35	10.65	3.81
FACILPH	3.57	1.88	8.52	2.47	5.51	2.59	6.95	3.03	5.15	2.94	5.48	2.59	5.72	2.59	7.22	2.94
NUMTCH	2.99	1.73	3.65	2.25	4.85	2.21	9.72	6.47	2.82	2.03	2.71	2.25	3.81	2.19	3.34	2.49
PTRATIO	38.79	19.52	64.85	39.95	23.89	18.94	5.48	1.86	50.51	29.31	42.05	17.78	29.52	13.11	61.15	32.32
PRIMARY	.96	.21	.83	.37	.80	1.04	.59	.49	.96	.19	.67	.00	.80	.40	.86	.35
PCTFEINT	25.40	30.46	50.10	39.96	53.25	18.59	54.68	20.72	16.25	28.64	13.26	25.48	20.65	26.69	28.31	32.86
PRESSLING	1.15	.29	1.48	.44	1.37	.40	1.18	.18	1.27	.42	1.30	.30	1.21	.35	1.36	.26
PRESSMTH	1.70	.34	1.84	.36	1.54	.41	1.63	.27	1.37	.48	1.41	.35	1.33	.37	1.41	.33
PRESSTST	-.06	.85	-.08	.77	-.07	.67	.02	.57	-.14	.76	-.07	.80	-.11	.61	-.08	.52
PRESSTHW	1.25	.35	1.82	.25	1.50	.41	1.43	.24	1.36	.48	1.40	.33	1.30	.44	1.57	.53
PRESSPHW	3.11	1.30	3.46	1.08	2.09	.82	1.77	.44	2.89	1.29	2.60	.96	3.04	1.40	1.67	.77
COMMIT	.02	.63	-.05	.69	-.05	.67	.003	.46	-.04	.65	-.01	.52	-.11	.73	-.07	.42
PRINTNV	2.01	.69	2.17	.77	2.07	.96	1.99	.47	2.09	1.03	2.52	.64	2.17	.93	2.56	.63
HMLEADER	2.28	.47	2.68	.96	2.62	.89	2.49	.35	1.77	1.03	2.65	.62	2.29	.56	2.01	.92

# Effect of School Level Variables on Achievement Gap Between Boys and Girls

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## ABSTRACT

*The central focus of the study is to explore the achievement gap between boys and girls on mathematics and language and school level factors that are associated with this gap. A sample of 1,746 schools, comprising 4,879 teachers and 23,700 students was covered in the study. Hierarchical Linear Model and Meta-analysis were used to analyse the data. The findings revealed that girls score approximately 12 per cent and 11 per cent standard deviation lower than boys in mathematics and language respectively. The continuous stay of teachers for not more than five years in the same schools, proper qualification of teachers, appropriate number of teachers and higher percentage of female teachers are likely to improve the performance of girls and thus the primary education.*

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## Introduction

There is no discrimination for admission to educational institution, but socio-economic factors often contribute to several segments of the population remaining socially and educationally backward. Generally, groups vulnerable

quality (4), school resources (7) and academic climate of school (8) are given in Annexure I.

### **Analysis Procedures**

For an exploratory analysis, boys and girls have been compared on mathematics and language achievement using student's 't' statistics to know the sex differences in the groups. The achievement scores of boys and girls, whose SES was below 10th and above 90th percentile, were selected from the sample and graphs between SES and achievement scores were drawn to know their relationship.

In the present analysis, only two level Hierarchical Linear Model (1992) was formulated in order to obtain stable results. Level-1 includes the pupil and level-2 includes the school level variables. The variation in mathematics and language achievement scores are partitioned into within (level-1) and between (level-2) units. Further, these variances have been adjusted at different levels to determine the significant effect of the variables. In order to see the unadjusted effect of gender gap on achievement, only GIRL was included in the model.

The within school variance of outcome variable was further adjusted for pupil level variables and termed as Type 'A' effect. This effect was further adjusted for the two school composition variables, i.e., mean of student's SES and per cent of SC/ST on the school means to minimize the bias due to these factors and termed as Type 'B' effect. The three groups of variables, i.e., Teacher's Quality, School Resources and Academic Climate of School, were included in Type 'B' effect to see the effect of these variables. Finally all the variables, which had the probability less than 20 per cent ( $p < .20$ ) were included in the Model and the results based only on this reduced model have been discussed in this paper.

Since the present paper attempts to find the effect of school level variables on the gender achievement gap, only the effects of GIRL slope have been discussed here.

The scores of both the achievement tests have been standardised at mean zero and standard deviation one. The values of variables, which were in ordinal scale, were given weights using Logit distribution. Variables obtained from pupil and teacher questionnaire were aggregated and centered at school level for each state. The variables of school questionnaire were also centered. The mean of all the variables is given in Annexure II.

### **Results**

The percentage of girls (Annexure II) varied from 37.3 in Orissa to 48.8 in Haryana. Kerala is the only state where all schools of the sample were co-

# EFFECT OF SCHOOL LEVEL VARIABLES ON ACHIEVEMENT GAP

educational. Tamil Nadu had only one school where there were no girls. In Madhya Pradesh, 165 schools were exclusively for boys, whereas 100 schools were exclusively for girls.

TABLE I  
Means and Standard Deviation of Achievement Scores

State	Subject	Sex	Mean	SD	N	't'
Assam	Math	Boys	20.17	7.17	880	
		Girls	19.54	7.51	826	1.77
	Lang	Boys	21.58	6.80	880	
		Girls	20.85	7.38	826	2.14*
Haryana	Math	Boys	15.52	5.44	1274	
		Girls	14.86	5.35	1215	3.04**
	Lang	Boys	36.79	11.30	1274	
		Girls	37.43	11.67	1215	1.40
Karnataka	Math	Boys	15.75	7.82	1541	
		Girls	15.31	7.82	1027	1.39
	Lang	Boys	16.50	7.20	1541	
		Girls	16.10	7.27	1027	1.38
Kerala	Math	Boys	14.97	5.78	1601	
		Girls	14.80	5.56	1488	0.80
	Lang	Boys	20.46	7.932	1601	
		Girls	20.92	8.309	1488	1.57
Madhya Pradesh	Math	Boys	11.50	5.30	4600	
		Girls	10.86	5.31	3418	5.33**
	Lang	Boys	29.17	14.48	4600	
		Girls	28.02	14.96	3418	3.45**
Maharashtra	Math	Boys	11.99	6.27	1207	
		Girls	11.25	6.75	936	2.63**
	Lang	Boys	17.30	8.21	1207	
		Girls	15.70	8.51	936	4.40**
Orissa	Math	Boys	14.71	6.76	855	
		Girls	14.45	6.33	509	0.69
	Lang	Boys	34.86	13.13	855	
		Girls	34.82	12.54	509	0.00
Tamil Nadu	Math	Boys	11.19	4.35	1260	
		Girls	11.36	4.97	1063	0.89
	Lang	Boys	30.93	10.23	1260	
		Girls	30.05	11.59	1063	1.94

Note : Level of significance \*  $p < 0.05$ ; \*\*  $p < 0.01$

In order to answer the first research question, two approaches, i.e. sex differences on achievement scores by student's 't' statistics and achievement gap obtained from HLM analysis have been discussed in the next section.

#### ACHIEVEMENT GAP BETWEEN GIRLS AND BOYS

Table 1 shows, on an average, the performance of girls is lower than boys in mathematics. Significant sex differences are found in Haryana, Madhya Pradesh and Maharashtra, where the girls scored marginally higher (.17) than boys.

In language, the performance of girls is lower than boys and are significantly different in the states of Assam, Madhya Pradesh and Maharashtra. However, the girls scored marginally higher, not statistically significant, in Haryana and Kerala.

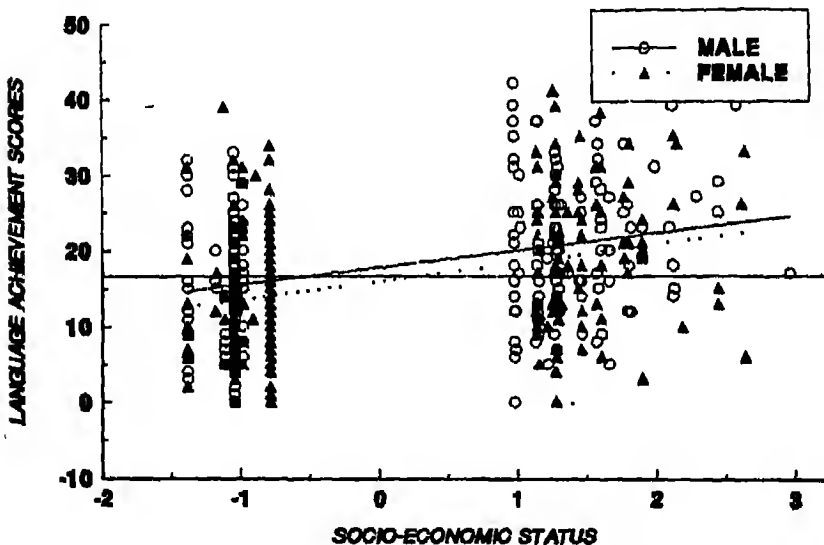


FIG. 1 Effect of SES on gender gap in language achievement of extreme groups (Maharashtra)

On the basis of sex differences, two states, Madhya Pradesh and Orissa were selected to see the relation of SES on mathematics achievement. Similarly, Maharashtra and Orissa were selected for language achievement.

In Maharashtra (Fig. 1), the gap in language achievement exists distinctively in low and high SES groups. The girls performed lower than boys.

# EFFECT OF SCHOOL LEVEL VARIABLES ON ACHIEVEMENT GAP

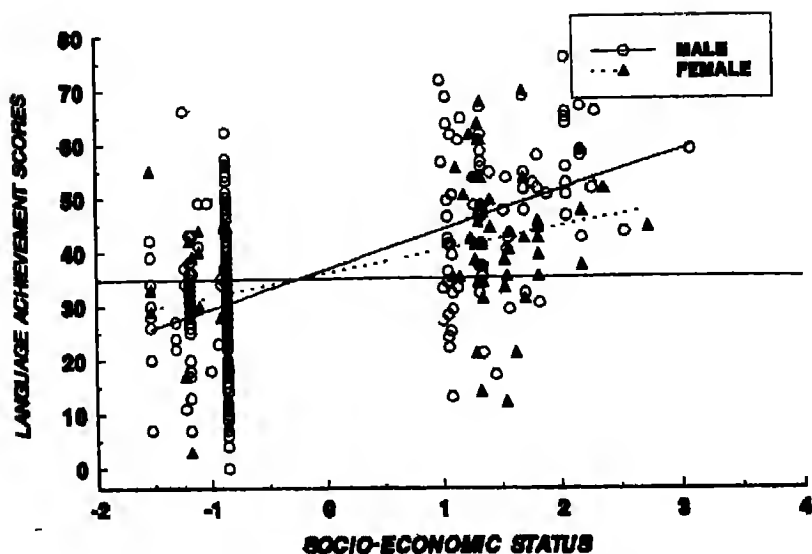


FIG. 2 Effect of socio-economic status on language scores of extreme groups (Orissa)

However, the gap marginally narrows down as SES of students increases.

In Orissa (Fig. 2), within low SES group, the girls performed better than boys in language. The situation is reversed as the SES of students increases from their group mean. The gap widens when it moves towards extreme points.

TABLE 2  
Percentile Scores of Socio-Economic Status for Boys and Girls

State	Boys		Girls	
	10th	90th	10th	90th
Assam	-.844	1.044	-.844	1.192
Haryana	-.833	.961	-.556	1.033
Karnataka	-.881	.980	-.655	1.186
Kerala	-.994	.823	-.705	.873
Madhya Pradesh	-.739	.824	-.739	1.281
Maharashtra	-.982	.978	-.780	1.032
Orissa	-.855	.989	-.855	1.103
Tamil Nadu	-.816	.842	-.816	1.101

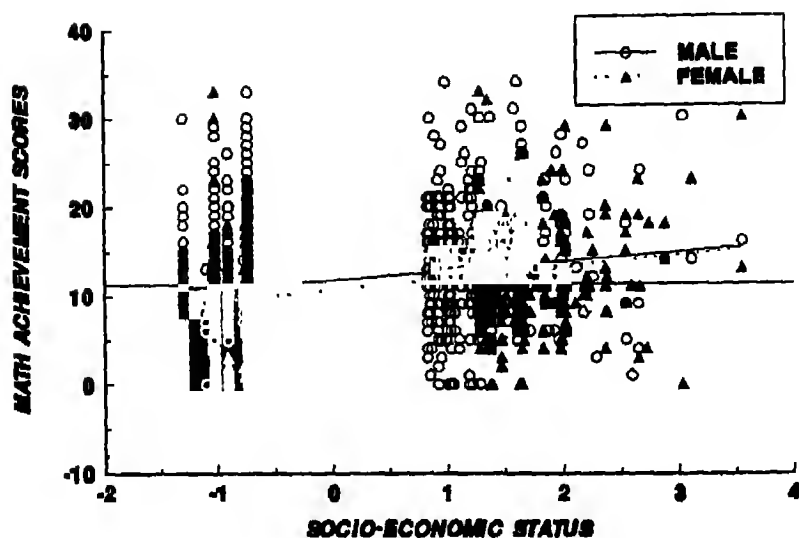


FIG. 3 Effect of SES on mathematics achievement of extreme groups (Madhya Pradesh)

In mathematics (Fig. 3), the girls performed lower than boys in both SES groups in Madhya Pradesh. However, the gender gap has narrowed down as SES of students has increased. Similar to Madhya Pradesh, girls performed lower than boys in Orissa (Fig. 4). The low SES students do not differ on the achievement. However, the gap increased as SES of students increases.

TABLE 3

Unadjusted Within and Between School Variance in Mathematics and Language Scores

Variance	Assam	Haryana	Karnataka	Kerala	Madhya Pradesh	Maharashtra	Orissa	Tamil Nadu
<b>Mathematics</b>								
Between School	48.3	31.3	60.6	19.6	45.6	39.3	44.1	36.0
Within School	51.7	68.7	39.4	80.4	54.4	60.7	55.9	64.0
<b>Language</b>								
Between School	35.0	35.6	45.2	13.7	45.4	37.7	29.1	32.8
Within School	65.0	64.4	54.8	86.3	54.6	62.3	70.7	67.2

# EFFECT OF SCHOOL LEVEL VARIABLES ON ACHIEVEMENT GAP

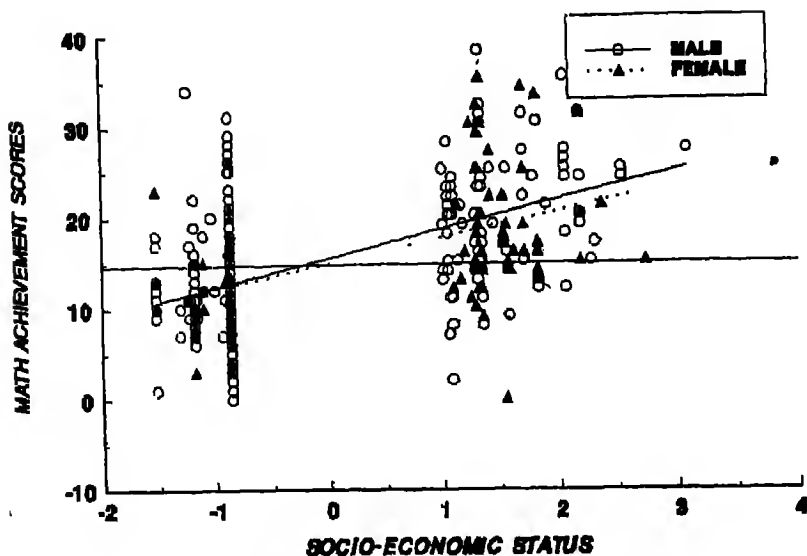


FIG 4 Effect of SES on mathematics achievement of extreme groups (Orissa)

One may observe from Table 2 that at 90th percentile, girls had the high SES than boys in all states. Whereas, at the 10th percentile, boys of Haryana, Karnataka, Kerala and Maharashtra had the high SES than girls. This shows that girls of high SES and boys of average SES are studying in these schools.

The HLM analysis reveals that the between school variance (Table 3) varies from 19.6 per cent in Kerala to 61 per cent in Karnataka for mathematics. In language, it varies from 13.7 per cent in Kerala and 45.2 per cent in Karnataka. The variation is significant in all the states.

The variation of achievement gap after adjusting the pupil and school level variables has been-discussed in the following section.

One can observe from Table 4 that the achievement gap has increased after controlling for the pupil level variables in both the subjects in almost all states. Kerala is the exception, where the achievement gap in mathematics has decreased from 0.048 to 0.007. The meta-analysis shows that the girl slope is negatively associated with the mathematics (.122,  $p < .01$ ) and language (-.113,  $p < .01$ ) achievement for Type-A effect in most of the states. However, in Kerala, the slope (.007) is marginally positively associated with the language achievement.

It indicates, on an average, girls score lower than boys, approximately 12.2



# EFFECT OF SCHOOL LEVEL VARIABLES ON ACHIEVEMENT GAP

TABLE 4

## Unadjusted and Adjusted Effects of Gender Achievement Gap

Effect	E/S	Asm.	Har	Kar.	Kei	M.P.	Maha.	Ori	T.N.	Av
<b>MATHEMATICS</b>										
Unadjusted	E	-.099	-.198	-.083	-.029	-.146	-.041	-.084	-.037	-.095**
	S	.048	.051	.045	.046	.025	.062	.055	.049	.021
Adjusted for Type 'A'	E	-.131	-.225	-.108	-.063	-.172	-.054	-.142	-.043	-.122**
	S	.048	.052	.044	.045	.025	.063	.053	.049	.022
Adjusted for Type 'B'	E	-.130	-.232	-.108	-.063	-.178	-.058	-.150	-.043	-.125**
	S	.048	.052	.044	.045	.025	.063	.054	.049	.023
Adjusted for Teacher Quality	E	-.130	-.235	-.103	-.064	-.172	-.059	-.151	-.043	
	S	.048	.052	.044	.044	.025	.062	.054	.048	
Adjusted for Research	E	-.127	-.225	-.113	-.064	-.180	-.056	-.110	-.043	
	S	.048	.051	.044	.045	.025	.063	.059	.049	
Adjusted for Climate	E	-.126	-.225	-.115	-.063	-.175	-.057	-.153	-.051	
	S	.047	.051	.044	.045	.024	.063	.054	.048	
<b>LANGUAGE</b>										
Unadjusted	E	-.104	-.039	-.090	.048	-.158	-.134	-.076	-.107	-.083*
	S	.053	.048	.048	.041	.026	.061	.061	.050	.026
Adjusted for Type 'A'	E	-.133	-.067	-.106	.007	-.189	-.153	-.149	-.117	-.113**
	S	.053	.048	.048	.039	.025	.060	.058	.051	.025
Adjusted for Type 'B'	E	-.128	-.070	-.105	.008	-.197	-.156	-.156	-.117	-.115**
	S	.052	.048	.048	.039	.025	.060	.059	.051	.026
Adjusted for Teacher Quality	E	-.135	-.059	-.099	.009	-.198	-.157	-.150	-.121	
	S	.052	.049	.048	.048	.039	.025	.060	.051	.049
Adjusted for Research	E	-.115	-.074	-.097	.009	-.191	-.179	-.165	-.095	
	S	.053	.048	.048	.039	.026	.061	.055	.050	
Adjusted for Climate	E	-.131	-.072	-.108	.010	-.195	-.158	-.160	-.125	
	S	.042	.047	.048	.039	.025	.060	.059	.050	

### Note

1. E and S stand for Effect and Standard Error respectively.
2. Level of significance \*  $p < .05$  ; \*\*  $p < .01$
3. AV is the average effect obtained from Meta-Analysis

per cent and 11.3 per cent standard deviation of mathematics and language achievement respectively. Both the effects were significant at 1 per cent level of significance.

## EFFECT OF SCHOOL LEVEL VARIABLES ON ACHIEVEMENT GAP

### BETWEEN AND WITHIN SCHOOL VARIATION

In mathematics, the between school variation (Table 5) of gender gap varies from 6.8 per cent in Madhya Pradesh to 21.9 per cent in Maharashtra. The within school variation of the achievement scores varies from 32.5 per cent in Karnataka to 69 per cent in Kerala. In language achievement, the between school gender gap varies from 6.1 per cent in Kerala to 20.5 per cent in Maharashtra. The variation is significant across the schools in all the states.

TABLE 5  
Residual Variance as Percentage of Total Variance for Type 'A' Effect

	<i>Assm.</i>	<i>Har.</i>	<i>Kar.</i>	<i>Ker.</i>	<i>M P</i>	<i>Maha.</i>	<i>Ori.</i>	<i>T.N.</i>
<b>MATHEMATICS</b>								
Gender Gap	11.49	10.82	13.88	11.38	6.84	21.93	7.14	12.05
Pupil's Score	43.77	62.03	32.54	69.00	50.52	42.50	52.47	56.83
<b>LANGUAGE</b>								
Gender Gap	13.63	8.09	13.01	6.07	8.80	20.48	8.72	13.52
Pupil's Score	55.77	59.45	39.81	78.46	48.80	47.06	65.61	56.12

It also shows that, for both the subjects, learning achievement of students varies across the states. Hence, there is a need to further explore the school level factors affecting the learning achievement of children.

In order to answer the second research question the effects of school level variables from HLM analysis are presented in the following sections.

### EFFECT OF TEACHER'S QUALITY

Meta-analysis (Table 6) shows that, on an average, teacher's qualification, i.e., years of schooling, is positively associated (.080,  $p < .05$ ) with the gender gap on language achievement in Assam, Maharashtra, Orissa and Tamil Nadu. It implies, on an average, one unit (year) increase of teacher's schooling may increase approximately 8 per cent of language achievement of students from mean.

Orissa and Tamil Nadu have been considered to know the predicted achievement slope of boys and girls for three cases of period of teacher's schooling as (i) the state average, (ii) 10 years and (iii) 14 years of education. For the state average, girl-TCHQUAL slope indicates that girls tend to score

# EFFECT OF SCHOOL LEVEL VARIABLES ON ACHIEVEMENT GAP

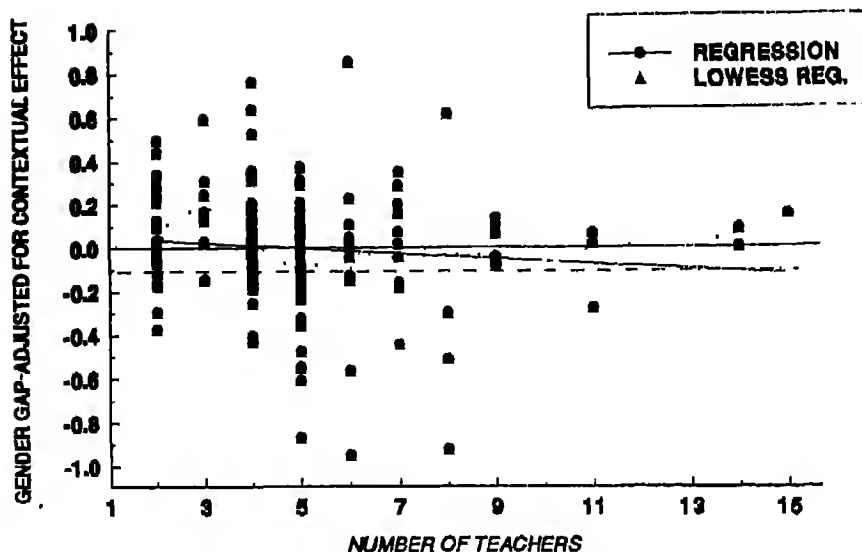


FIG. 6 Effect of teachers on gender gap in language achievement (Karnataka)

## EFFECT OF SCHOOL RESOURCES

For mathematics, the variable access to teaching material has positive association (.095,  $p < .05$ ) in Assam (Table 7) and negative association (-0.038) in Karnataka. Instructional material used for teaching of mathematics in the classroom has negative association with the gender gap in Assam (-0.079,  $p < .05$ ) and Haryana (-0.026) and no significant association is found in other states for both the subjects. Out of 12 items, on an average, 6 items are available in the states. It seems either the educational materials are not in good condition or not properly used by the teacher.

Physical facility available in the school has a positive association with the gender gap in Karnataka, whereas, in Assam it has negative association on both the subjects. In Orissa, the facility is negatively associated (-0.057,  $p < .05$ ) with language achievement. The meta-analysis shows that the variable do not have significant impact on the learning achievement of students. Out of 14 items, on an average, 4 to 8 items are available in the school.

In language achievement, meta-analysis (Table 7) shows that, on an average, number of teachers in a class has negative association (-0.021,  $p < .05$ )

# EFFECT OF SCHOOL LEVEL VARIABLES ON ACHIEVEMENT GAP

TABLE 7  
Effects of School Resources on Gender Gap

Variables	Assm	Har.	Kar.	Ker.	M.P.	Maha.	Ori.	T.N.	AV
	Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)
<b>MATHEMATICS</b>									
Material	.095* (.040)		-.038 (.023)						.024 (.066)
Facility in Education	-.079* (.032)	-.026 (.018)							-.046* (.026)
Physical Facility	-.031 (.028)		.024 (.018)						.001 (.027)
Primary	.273 (.184)						-.272* (.133)		-.014 (.272)
% Female Teachers				.003 (.002)	.002 (.001)	-.003 (.002)	.003 (.002)		.001 (.001)
<b>LANGUAGE</b>									
Physical Facility	-.046 (.028)		.018 (.018)				-.057** (.019)		-.027 (.025)
Number of Teachers		.011 (.022)	-.047* (.023)		-.019 (.012)			-.032 (.020)	-.021* (.009)
P.T Ratio			-.004 (.003)			.007 (.004)			.001 (.005)
Primary		-.262* (.127)				-.183 (.122)	-.155 (.127)		-.200* (.072)
% Female Teachers					.002* (.001)		.004* (.002)	.004* (.002)	.001 (.002)

## Note

1. Level of significance \*  $p < .05$  ; \*\*  $p < .01$
2. AV is the average effect obtained from Meta-Analysis

with the gender gap in Haryana, Karnataka, Madhya Pradesh and Tamil Nadu. In Karnataka, the predicted NUMTCH-girl slope is 0.076 for the two teachers, -.105 for average number of teachers and -.159 for seven teachers, indicating that large number of teachers in a school has a negative effect on the learning achievement of girls. Similar trend is found for boys also. On an average, from three teachers in Assam, Madhya Pradesh and Maharashtra to 10 teachers in Kerala are working in a school. One can see if the number of teachers exceed the state average, the students achieve lower than what they achieve with fewer teachers. Graph for Karnataka (Fig. 6) shows the similar trend for the effect of number of teachers in a school on language achievement. Pupil-teacher ratio has a negligible impact on the learning achievement of both the subjects.

# EFFECT OF SCHOOL LEVEL VARIABLES ON ACHIEVEMENT GAP

For language achievement, schools having only primary sections has a negative association with the gender gap in language achievement in Haryana (-.262,  $p < .05$ ), Maharashtra (-.183) and Orissa (-.155). The average effect (-.200) is significant at 5 per cent level of significance. The predicted girl-primary achievement slope shows that girls studying in primary schools of Haryana have a weak slope (-.085) than those girls studying in extended primary schools with steep slope (.180). Almost similar trend is found for boys. Similar observations are made in Orissa also. In Orissa, LOWESS regression curve has shown that in fact girls tend to perform better than boys in extended primary schools. In mathematics achievement, similar observations are made for Orissa also. However, in Assam, girl slope (.273) is not significantly associated with the gender gap.

TABLE 8  
Effects of Academic Climate of School on Gender Gap

Variables	Asm. Coef (SE)	Har. Coef (SE)	Kar. Coef (SE)	Ker. Coef (SE)	M.P. Coef (SE)	Maha. Coef (SE)	Ori. Coef (SE)	T.N. Coef (SE)	AV Coef (SE)
<b>MATHEMATICS</b>									
Press Maths		-.244 (.164)			-.195* (.081)	-.084 (.191)	-.433* (.197)		-.215* (.065)
Teachers	.226 (.135)				.168* (.078)			-.275 (.154)	.056 (.147)
Teacher's Commitment				.191 (.108)			.195 (.117)	.251* (.126)	.209* (.067)
Parent's Involvement	.142* (.068)	-.092 (.071)	-.091* (.047)						-.017 (.076)
<b>LANGUAGE</b>									
Teacher	.287* (.133)			.275 (.160)					.282* (.102)
Assign HW					.037 (.025)				-.017 (.066)
Parent's Involvement		-.097 (.065)							
HM Leader		.107* (.053)					.092 (.053)	.100* (.038)	

## Note

1. Level of significance \*  $p < .05$ , \*\*  $p < .01$
2. AV is the average effect obtained from Meta-Analysis

## EFFECT OF SCHOOL LEVEL VARIABLES ON ACHIEVEMENT GAP

Percentage of female teachers in a school has a weak association with the gender gap on both the subjects. In Orissa, with average 20 per cent of female teachers, girls score 10 per cent below the mean and boys score 6 per cent above the mean. However, if the percentage of teachers are increased to 50 per cent the girls and boys tend to score 1.6 per cent and 18 per cent respectively above the mean. The LOWESS regression curve (Fig. 7) has shown that girls tend to score higher than boys.

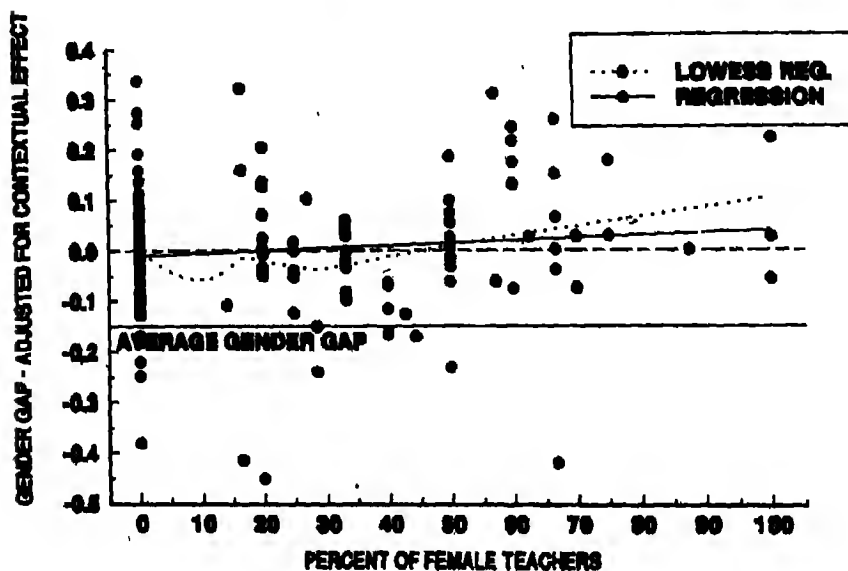


FIG 7 Effect of female teachers on gender gap in language achievement (Orissa)

## EFFECT OF ACADEMIC CLIMATE OF SCHOOL

The academic activity in teaching of mathematics is negatively associated (Table 8) with the gender gap in Haryana, Madhya Pradesh, Maharashtra and Orissa, indicating, on an average, girls score lower than boys. The meta-analysis also shows that the average effect size ( $-0.215$ ) is significant at 5 per cent level of significance. The effect of the variable is smallest ( $-0.084$ ) in Maharashtra and largest ( $-0.433$ ) in Orissa. We consider two extreme cases (i) when teacher does not assign any problem to solve and (ii), when teacher assigns problems regularly to predict the achievement slope for boys and girls. In Orissa, for first case, girls and boys score approximately 48 per cent and 63 per cent

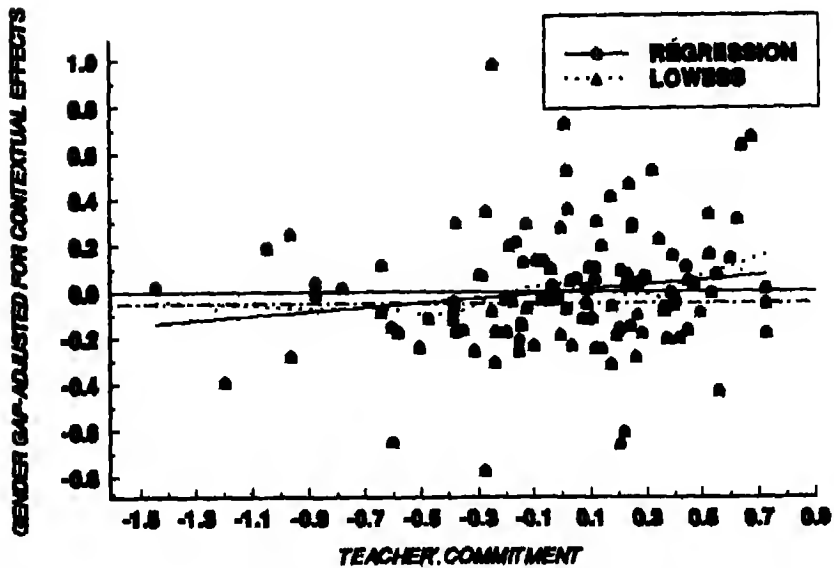


FIG. 8 Effect of teacher's commitment on gender gap in mathematics achievement (Tamil Nadu)

respectively above the mean. Whereas, girls and boys score approximately 38 per cent and 23 per cent below the mean. In Maharashtra, for the first case, girls and boys score approximately 8.7 per cent and 14.4 per cent above the mean, whereas for the second case, girls score 88 per cent below the mean and boys score 2.4 per cent above the mean. In both the states, students, in particular girls, are losers if the teacher assigns mathematics problems regularly in the class. Shukla (1994) has also indicated in her study that teacher's knowledge of the subject-matter was highly inadequate.

As regards academic activity of teaching of language, only state of Assam has a negative association ( $-0.537$ ) with the gender gap.

Academic activity that teacher assigns homework in mathematics has positive association in Assam ( $.226$ ) and Karnataka ( $.168$ ) and has negative association ( $-.275$ ) in Tamil Nadu. In language, the variable has a positive association ( $.287$ ,  $p < .05$ ) in Assam only. One can predict the score in two extreme situations, i.e., (i) if teacher does not assign the homework, the students score below the mean and (ii) if he/she assigns regularly, students score above the mean. Whereas, the situation is reverse in Tamil Nadu.

Similar pattern has been observed in case of teacher's commitment in teaching of mathematics, i.e., if he/she pays attention towards the class, the

students tend to score higher. A graph showing effect of teacher's commitment on achievement of mathematics is presented in Fig. 8.

For mathematics, parent's involvement, i.e., parents attend the parent-teacher meetings and meet teachers individually to discuss the performance of child, has positive association in Assam (.142) and negative association in Haryana (-.092) and Karnataka (-.091).

The leadership of the headmaster has a positive association (.100,  $p < .05$ ) with teaching of language. It indicates that if teacher meets the headmaster to review the performance of his class and all primary classes of the school, improves the achievement of the children by 10 per cent of standard deviation above the mean.

### Summary of the Findings

The analysis examined a sample of 1,746 schools, comprising 4,879 teachers and 23,700 students collected under Baseline Achievement Study in 1993 to study the achievement gap between boys and girls. The results from t-test and HLM analysis revealed that achievement gap exists between boys and girls. Further, it shows that the achievement gap increases in both the subjects after controlling the pupil level variable in most of the states and it has negative association with the achievement, Kerala is the exception, where the gap has decreased marginally in language. It is also estimated that girls' score is approximately 12.2 per cent and 11.3 per cent standard deviation lower than boys in mathematics and language achievement respectively. The achievement gap in mathematics is larger than language.

The results of second level of HLM analysis answer the second research question, i.e., to what extent the school level factors are associated with the gender gap. It shows that the higher qualification of teachers helps in improving the achievement of students to some extent. However, students, in particular girls, tend to perform higher provided teacher's with graduate and above qualification are not appointed at the primary stage. Further, continuous stay of teachers for not more than five years in the same school is likely to improve performance of girls. The teachers do not have the access to teaching material or it has not made any discernible impact on the learning achievement of children, particularly on the gender achievement gap. Large number of teachers in a school has a negative effect on the achievement of children.

The students perform better in the extended primary schools than primary schools. The extended primary schools, i.e., middle and secondary schools are generally available at block and district level. Hence, they attract good students and thus the peer group effect on the learning achievement of children. The presence of more than 50 per cent female teachers in a school is likely to



improve the performance of girls. It is possible that the girls feel more homely with the presence of female teachers in the school.

The frequent assignment of mathematics problems is negatively associated with the achievement gap between boys and girls. However, teacher's commitment and leadership of headmaster has made a positive impact on the learning achievement of children.

### **Educational Implications**

The above findings bring out certain implications for school based intervention on teacher quality, use of educational facilities in school, academic press, school climate and school policies.

The variables studies under teacher quality revealed that teacher with average qualification (prescribed for primary school teacher) tend to reduce the achievement gap between boys and girls. Perhaps teacher with higher qualification may seek the job of primary teacher but not committed to teaching at this level. So this fact may be considered at the time of appointing teacher at this level. On the other hand longer duration of stay in the particular school enlarge the gap between boys and girls on achievement. It may be due to monotony and boredom. Training programme should be arranged to equip the teacher with innovating teaching strategies, enhance their motivation and nurture commitment.

It is assumed that facilities are prerequisite of better learning. The study highlighted that, though the facilities are available in the school but not affecting the learning performance of girls. Therefore, strict supervision should be arranged to see the usability condition of the materials and its constant use in teaching learning process. Also the teacher should be trained in the effective use of those materials.

Due to pressure of academic activity in mathematics, probably girls are not able to cope with the task and become demotivated. This may lead to lower achievement. Therefore, remedial classes can be arranged to overcome their deficiencies in mathematics through suitable teaching strategies.

With reference to policy implication, the findings suggest that girls are performing better in the primary school which is attached to middle and secondary sections. It may be because of wide variety of experiences, opportunities and interaction with peer groups. The extension of primary school with higher grade may not be only beneficial for girls but also for other students. Second aspect emphasize the benefit of female teacher in school. It shows that girls are performing better in school with higher percentage of female teacher. This finding supports the principle of Operation Blackboard scheme where female teachers were provided in the school.

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# EFFECT OF SCHOOL LEVEL VARIABLES ON ACHIEVEMENT GAP

## ANNEXURE I

### Indicators Used in the Study

<i>S.No. Label</i>	<i>Indicator</i>	<i>Treatment/Remarks</i>
<b>I. Pupil's Background Variables</b>		
1 GIRL (SS 3)	Gender	Girl = 1, Boy = 0      Centered at Pupil Level
2. SCST (SS 6)	Caste	SC or PST = 1, Non-SC/ST = 0      Centred at Pupil Level
3. DADED (SS 9)	Father Education	Applied Logit
4. MUMED (SS9)	Mother Education	Applied Logit
5 DACOCC (SS 10)	Father Occupation	Unskilled worker = 1; Poultry farming = 2; Picking forest produce = 3, Agri. labourer = 4; Farmer = 5; Skilled worker = 6, Street vendor = 7; Others = 8; Self employed = 9; Domestic servant = 10, Household = 11; Clerk = 12; Employer = 13; Senior Officer = 14 Applied Logit
6. REPEAT (SS H14)	Ever Repeated Class	Repeat = 1 if yes in any class Else = 0 Centre at Pupil Level
7 SES	Socio-economic Status	SES = (DADED + MUMED + DADOCC)/Valid responses Composite & standardised
<b>II. Contextual Variables</b>		
1. MEANSES	School Mean SES	Aggregated from pupil to school level Centered at School Level
2. PCTSCST	Per cent SCST	Per cent of SC and ST in the school Centered at School Level
<b>III. Teacher's Quality Variables</b>		
1. TECHQUAL (TS 4)	Teacher's Qualification	Class VIII = 8, Class X = 10, class XI/XII = 12, graduate = 14, post graduate = 16 Aggregated & centered at school level
2. TCHEXP (TS 10B)	Experience	Subtracted year of first appointment from 1993 Aggregated & centered at school level
3. INSERVICE (TS 13)	In-service training	INSERVICE = 1, if received during last 3 years Aggregated & centered at school level
4. STABLE (TS 10C)	Period in present school	Subtracted year of appointment (from 1993) Aggregated & centered at school level

# EFFECT OF SCHOOL LEVEL VARIABLES ON ACHIEVEMENT GAP

<i>S No. Label</i>	<i>Indicator</i>	<i>Treatment/Remarks</i>
<b>IV. Resource Variables</b>		
1. MATERIAL (TS 20A 21A1-A9)	Access to Teaching Material	Add all "yes = 1"  Aggregated & centered at school level
2. FACILED (SRS 22 (1-9, 15, 16))	Instructional Material Available	Add all "yes = 1" Aggregated & centered at school level
3. FACILPH (SRS 22 (10, 12-14, 18-27))	Physical Facility	Add all "yes = 1"  Aggregated & centered at school level
4. NUMTCH (SRS 9)	No. of Teachers	Total of male & female teachers for 1993-94 Centered at school level
5. PTRATIO (SRS 6C)	Pupil Teacher Ratio	Total enrolment of classes 1-V/Numtch Centered at school level
6. PRIMARY (SRS3)	Primary and Extended Primary	Primary = 1 for classes 1-IV/V, Else = 0
7. PCTFEMT (SRS 9)	Percent Female Teachers	Female teachers* 100/Numtch Centered at school level
<b>V. Academic Climate of School</b>		
1. PRESSLNG (SS 30, 32)	Academic Press in language	Teachers ask to read & give dictation in class Never = 0, Sometimes = 1, Everyday = 2, Average by valid responses, Agg. & centered at school level
2. PRESSMTH (SS 33)	Academic Press in Maths	Teachers give arith. problems to solve in class Never = 0, Sometimes = 1, Everyday = 2 Aggregated & centered at school level
3. PRESSTST (SS 34)	Academic Press test & feedback	Teachers give test and feedback to students For test-never = 1, once in a while = 2, once in a year = 3, once in a term = 4, once in a month = 5, once in a week = 6, For feedback-not applicable = 1, never = 2, sometimes = 3, always = 4 Average by valid responses after using Logit Aggregated & centered at school level
4. PRESSTHW (SS 35A, C)	Academic Press teachers give HW	Teachers assign and correct Homework Never = 0, Sometimes = 1, Always/regularly = 2 Average by valid responses Aggregated & centered at school level
5. PRESSPHW (SS 35B)	Academic Press Pupil given Homework	No & do not do homework = 0, less than 30 min. = 1 30-60 mins. = 2, 61-120 mins. = 3, over 120 mins = 4. Aggregated & centered at school level
6. COMMIT (SS 29A, 36)	Teacher Commitment	Teacher comes to class—Rarely = 1, Sometimes = 2, Most of the day = 3 Everyday = 4 Teacher provides special help — Never = 1, Sometime = 2, Always = 4

# EFFECT OF SCHOOL LEVEL VARIABLES ON ACHIEVEMENT GAP

<i>S.No. Label</i>	<i>Indicator</i>	<i>Treatment/Remarks</i>
		Average by valid responses after Logit Aggregated & centered at school level
7. PRNTINV (TS 30C, D)	Parent Involvement	Parent-teacher meeting, meeting parents, Never = 0, Once in a year = 1, Once in a term = 2, Once in a month = 3, Once in a week = 4 Average by valid responses Aggregated & centered at school level
8. HMLEADER (TS 30A, B)	Head teacher as leader	Reviewing the performance of his/her class and all classes — Never = 0, Once in a year = 1, Once in a term = 2, Once in a month = 3, Once in a week = 4 Average by valid responses Aggregated & centered at school level

# ANNEXURE II

State-wise Mean and Standard Deviation

Variable	Assam		Haryana		Karnataka		Kerala		Madhya Pradesh		Maharashtra		Orissa		Tamil Nadu	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Outcome Variable																
MATH	19.87	7.35	15.20	5.40	15.58	7.82	14.89	5.67	11.23	5.31	11.67	6.49	14.61	6.61	11.27	4.65
LANG	21.23	7.09	37.10	1.48	16.34	7.23	20.68	8.11	28.68	14.69	16.60	8.38	34.85	12.91	30.53	10.88
Pupil's Background																
GIRL	48	.50	49	.50	.40	.49	.48	.50	.43	.50	.44	.50	.37	.48	.46	.50
SCST	24	.43	24	.43	.23	.42	.11	.32	.26	.44	.35	.48	.38	.49	.27	.44
DADED <sup>§</sup>	00	1.00	.00	1.00	.00	1.00	.00	1.00	.00	1.00	.00	1.00	.00	1.00	.00	1.00
MUMED	00	1.00	.00	1.00	.00	1.00	.00	1.00	.00	1.00	.00	1.00	.00	1.00	.00	1.00
DADOC.	00	1.00	.00	1.00	.00	1.00	.00	1.00	.00	1.00	.00	1.00	.00	1.00	.00	1.00
REPEAT	37	.48	33	.47	.23	.42	.21	.41	.31	.46	.31	.46	.31	.46	.31	.46
SES	00	.79	00	.73	.00	.75	.00	.67	.00	.74	.00	.74	.00	.77	.00	.71

## School Level Variables

### Contextual

MEANSES	-17	54	-03	49	-14	55	00	36	-18	-53	-16	53	-23	66	-04	39	
PCTSCST	33	19	42.00	25.55	24.52	25.30	25.74	11.41	14.44	30.68	29.93	37.53	32.05	48.23	37.15	26.77	30.03

Variable	Assam		Haryana		Karnataka		Kerala		Madhya Pradesh		Maharashtra		Orissa		Tamil Nadu	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
<b>Teacher's Quality</b>																
TECHQUAL	9.95	1.23	10.73	.92	11.37	1.40	11.47	.80	12.55	1.60	11.07	1.26	11.68	1.40	11.73	1.23
TCHEXP	15.18	7.50	16.69	7.49	12.31	8.42	13.97	4.91	16.24	8.46	15.84	8.44	14.39	6.50	20.47	7.15
INSERVIC	.31	.33	.64	.36	.55	.39	.68	.27	.52	.40	.64	.36	.43	.31	.72	.31
STABLE	7.60	5.53	3.87	3.07	4.82	4.04	8.03	5.29	7.51	5.10	5.29	4.68	4.67	3.28	7.59	5.34
<b>School Resources</b>																
MATERIAL	3.41	2.47	5.97	2.07	6.70	2.12	5.93	1.99	4.73	3.07	6.54	2.05	8.15	1.76	7.93	1.93
ACCILED	4.35	3.20	8.68	3.08	8.92	1.56	5.80	3.17	6.55	4.47	7.87	3.28	10.22	3.35	10.65	3.81
FACILPH	3.57	1.88	8.52	2.47	5.51	2.59	6.95	3.03	5.15	2.94	5.48	2.59	5.72	2.59	7.22	2.94
NUMTCH	2.99	1.73	3.65	2.25	4.85	2.21	9.72	6.47	2.82	2.03	2.71	2.25	3.81	2.19	3.34	2.49
PFTRATIO	38.79	19.52	64.85	39.95	23.89	18.94	5.48	1.86	50.51	29.31	42.05	17.78	29.52	13.11	61.15	32.32
PRIMARY	.96	.21	.83	.37	.80	1.04	.59	.49	.96	.19	.67	.00	.80	.40	.86	.35
PCTFEMT	25.40	30.46	50.10	39.96	53.25	18.59	54.68	20.72	16.25	28.64	13.26	25.48	20.65	26.69	28.31	32.86
<b>Academic Climate</b>																
PRESSLNG	1.15	.29	1.48	.44	1.37	.40	1.18	.18	1.27	.42	1.30	.30	1.21	.35	1.36	.26
PRESSMTH	1.70	.34	1.84	.36	1.54	.41	1.63	.27	1.37	.48	1.41	.35	1.33	.37	1.41	.33
PRESSTST	.06	.85	-.08	.77	-.07	.67	.02	.57	-.14	.76	-.07	.80	-.11	.61	-.08	.52
PRESSTHW	1.25	.35	1.82	.25	1.50	.41	1.43	.24	1.36	.48	1.40	.33	1.30	.44	1.57	.33
PRESSPHW	3.11	1.30	3.46	1.08	2.09	.82	1.77	.44	2.89	1.29	2.60	.96	3.04	1.40	1.67	.77
COMMIT	.02	.63	-.05	.69	-.05	.67	.003	.46	-.04	.65	-.01	.52	-.11	.73	-.07	.42
PRNTINV	2.01	.69	2.17	.77	2.07	.96	1.99	.47	2.09	1.03	2.52	.64	2.17	.93	2.56	.63
HM/LEADER	2.28	.47	2.68	.36	2.62	.89	2.49	.35	1.77	1.03	2.65	.62	2.29	.56	2.01	.92

# **Effect of Pupil and School Level Variables on the Achievement of Scheduled Caste/ Scheduled Tribe Students**

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## **ABSTRACT**

*The study focuses on the difference between SC/ST and non-SC/ST students on mathematics and language achievement and identifies the pupil and school level factors attributable to those differences. The sample comprised 5,292 SC/ST and 17,771 non-SC/ST students of IV/V grade. Hierarchical Linear Regression Model and Meta Analysis were used for the analysis of data. The results reveal that SC/ST students score lower than non-SC/ST students in both the subjects. Father's education contributes for better achievement of SC/ST students. In mathematics, the achievement gap does not vary significantly across the schools whereas in language, it varies in Karnataka and Kerala. Test and feedback provided by the teacher tends to reduce the gap between SC/ST and non-SC/ST students in language.*

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## **Context and Focus**

The Educational Policy of India as revised in 1992 has asserted the need for equality in education which has been reiterated in section 4.1 of the document.



It states that : "The new policy will lay special emphasis on the removal of disparities and to equalise educational opportunity by attending to the specific needs of those who have been denied equality so far." Since the Scheduled Caste (SC) and Scheduled Tribe (ST) groups are one of the recognized disadvantaged group of the society, special planning and efforts have been made for the last couple of years to achieve equality in education for them. Equal accessibility to education for this disadvantaged group has been substantially augmented by the sincere effort of government by providing schooling facilities to the habitations predominantly populated by SC/ST. According to Programme of Action (POA, 1992), the dropout rate during 1987-88 for SC (51.60) and for ST (65.20) at primary stage is quite alarming as compared to the general category (46.97). Efforts are still on to overcome the problems of enrolment and dropout of children belonging to this group. In addition to other corrective measures, attractive school atmosphere supplemented with successful learning experiences is thought to be a solution to avoid these problems.✓

Student's achievement as an area of research has been extensively studied in our educational system. Shukla, *et. al.* (1994) found that SC/ST students had low performance at primary level as compared to backward and other caste students in the entire country. However, the result of the same study varied across states. The low attainment level of SC and ST students also enunciated in the Baseline Assessment Studies on different States (Jangira & Ahuja, 1995; Jangira & Paranjpe, 1995; Jangira & Yadav, 1994; Yadav, 1994; Gupta, 1995; Varghese, 1994). These findings generally provoke an exploration of causes related to the low achievement of SC/ST children. With this as the framework an attempt has been made to address the following three pertinent questions, such as:

- (a) How far SC/ST and non-SC/ST students differ in their mathematics and language achievement?
- (b) What is the difference that exists within schools and/or between schools?
- (c) Which are the school level factors that minimize such differences ?

### Survey of Earlier Studies

Studies regarding the variables affecting achievement of SC/ST students at primary stage are very scant. However, studies in the area of correlates of achievement at primary stage were reviewed. Buch and Buch (1983) synthesized more than 200 studies focusing on the determinants of learning outcomes at the level of primary education. The correlates of pupil's performance are categorized into three groups as family characteristics, school characteristics and individual characteristics. Parents' social class, education and occupation and family environment are found to be significant influencing variables among the family characteristics. Facilities and equipments in the school, institutional climate and

leadership behaviour of the principal, teacher qualification and training, high morale of teacher and positive perception of the academic ability of learner constitute a powerful set of factors determining the learning levels of children. Dave (1988), in a national study, compared the achievement level of students in different grades (I to IV) on mathematics and language achievement and concluded that there was a declining trend in the performance of students with increase in grade. However, the comparison between project and non-project schools has indicated the possibility of raising the attainment level of children through better classroom transaction and improved curricular input.

Several studies on home background have revealed its positive impact on student's learning. Sarkar (1983) reported that there was a significant difference between the high and low achievers in terms of educational environment, income, social background, provision of facilities and parent-child relationship. Studies of Jagannadhan (1985) and Shukla, *et al.* (1994) also stated the discernible positive influence of home background on students' learning. Shukla (1984) explored the relationship of socio-economic status (SES) of primary school students with their achievement in arithmetic, general science and social studies. The study revealed that SES was positively and significantly related to the achievement in these subjects. Malik (1984) found that children of illiterate parents had significantly lower academic achievement after controlling for their socio-economic status and intelligence.

In a recent study Shukla (1994) investigated the relationship of schools factors with language and mathematics achievement of primary school students. She found that facilities for teacher, adequate classroom facilities, teaching experience of headmaster, time devoted to teaching arithmetic, educational facilities available in the school and functional parent-teacher association had a salutary effect on the students' achievement.

The reviewed studies provide a very significant information for improving the quality of primary education in general and enhancing students' achievement in particular. But these factors have not been investigated precisely for SC/ST students at the primary stage. These students being the weaker section of the society confront with economic deprivation, lack of enriching and stimulating environment at home which may irreparably limit their learning skills. Further educational and occupational status of parents of these children may restrict their active initiation to glamourize education as a valued experience. Additionally, educational deficits that SC/ST children brought with them to the classroom may be multiplied with various factors operated at the school level. On the other hand, in the earlier studies it is found that the influencing variables were not treated at pupil and school levels separately through robust statistical measure. Keeping in view these two aspects in mind a systematic attempt has been made in the present study.

The exploration of these factors are not only prescribed for research but also assumed to fulfil the current objectives of District Primary Education Programme (DPEP). It will be immensely helpful for reducing the achievement gap between SC/ST and non-SC/ST children and improving their level of attainment at primary stage.

### Data and the Sample Structure

The data collected under Baseline Assessment Studies (BAS) were used in this study. The BAS covered 44 districts of Assam, Haryana, Karnataka, Kerala, Maharashtra, Madhya Pradesh, Orissa and Tamil Nadu. Detailed information about teacher, school and pupil's characteristics were collected through different schedules meant for teacher, school and pupil respectively. To estimate achievement of students on language and mathematics, standardized achievement tests (Shukla, *et al.* 1994) were used. The sample comprised of 5,292 SC/ST and 17,771 non-SC/ST students of IV/V grade.

TABLE 1  
Percentage of Schools at Different Levels of Concentration of SC/ST Students

States	Total Schools	Level of Concentration					Mean % of SC/ST in the Sample
		0 %	0.25 %	25.50%	50-75%	75-100%	
Assam	161	18.45	12.42	6.21	5.59	27.33	33.19
Haryana	144	14.58	47.22	22.22	10.42	5.55	25.55
Karnataka	176	22.73	34.66	23.86	10.23	6.52	25.30
Kerala	113	30.97	54.87	10.62	3.54	0	11.41
Maharashtra	135	12.59	31.11	28.15	8.89	19.26	37.53
Madhya Pradesh	733	21.28	29.74	24.97	11.46	12.55	30.67
Orissa	165	14.54	16.97	20.61	16.36	31.51	48.23
Tamil Nadu	119	26.05	36.97	16.81	6.72	13.44	26.78
Total	1746	23.02	31.10	21.25	10.14	14.49	

The scrutiny of SC/ST sample (Table 1) reveals that the highest percentage (48.23) of SC/ST students are found in the state of Orissa. Also concentration of SC/ST students in schools is the highest in Orissa where SC/ST students constitutes 75 to 100 per cent of the total children in 31.51 per cent schools.

Taking total sample under consideration, 23.02 per cent of schools have no SC/ST students and 31.10 per cent schools have up to 25 per cent of SC/ST students.

### Data Analysis and Procedure

In order to answer each of the three questions mentioned above, the analysis can broadly be classified into three stages. The first stage consists of exploring the raw scores with respect to mean achievement of SC/ST and non-SC/ST. The achievement scores are dependent on students' background and schools policies and practices. Both of them are not independent but are nested in each other. The second stage comprises analysis of data using hierarchical data structure in multilevel modeling (Bryk and Raudenbush, 1992). In this process of HLM analysis, various models relevant to monitor school performance (Willms, 1992) have been used. In order to explore the behaviour of achievement of the SC/ST students further, a step-wise regression analysis is undertaken to estimate the contribution of some of the important student level variables, i.e., related to home background and whether the student has repeated a class or not. The aforesaid analysis is carried out separately for mathematics and language achievement in two states (Kerala and Tamil Nadu). The results of adjustment for student background are expected to be at variance because of variations among states. The results are synthesized by using meta analysis after adjustment of achievement scores for students' background. Finally, the adjustment for contribution of school practices and policies have been attempted in those states where slope of SC/ST vary significantly across the schools at students' level. This analysis aims to identify the school level factors responsible for explaining the gap between SC/ST and non-SC/ST students.

### Variables Covered

The scores obtained by SC/ST and non-SC/ST students on language and mathematics are treated as outcome variables. The maximum score in the mathematics test is 40 whereas the score in language is 44 and 84 in class IV and V respectively. Mathematics and language scores are standardized at the individual level using the state mean and standard deviation. The average scores obtained from HLM analysis are expressed as effect size, that is, as fraction of a standard deviation.

### PUPIL LEVEL VARIABLES

A series of pupil background variables are constructed from pupil schedule (present). The variables sex, caste, repeated the class and preschool experience

are treated as dummy variable. Ordinal measures are constructed for father's education, mother's education and father's occupation. Socio-economic status (SES) is a composite variable of the above mentioned three variables related to parental status. Family size, head of the family and preschool experience are excluded from treatment examining their negligible influence. Pupil background variables are centred around at the pupil level on the basis of their state mean. So the estimated value is considered as the score of a child having the average state characteristics of that variable.

#### SCHOOL LEVEL VARIABLES

School level variables are selected from the teacher and school schedules and some are aggregated from pupil schedule. The first two are contextual variables, i.e., Mean SES and percentage of SC/ST children which are constructed by aggregating data from pupil level to school level. Rest of the school level variables are clustered into four categories — (a) Teacher Quality, (b) School resources, (c) School climate, and (d) Intervention launched in schools. Teacher qualification, teaching experience, in-service education and stability of teacher in terms of duration of service in the same school are the components of teacher quality. In school resources seven variables — teaching material for teachers, instructional material available in school, physical facility, number of teachers, pupil-teacher ratio, school with only primary section and percentage of female teachers—are included. Academic pressure in terms of specific attention to language and mathematics subjects, test and homework given by teacher, teacher commitment, parent involvement and leadership of head teacher (all together eight variables) are clustered in to school climate. Seven variables are constituted on operation blackboard and different incentive schemes for intervention category. Among these variables, operation blackboard and school with only primary grade are treated as dummy variables. Rest are operated as continuous variables. Composite variables are formulated by giving proper weightage through logit distribution. All variables are centred at the school level on the basis of their state mean.

#### Results

In the first step of analysis significant difference between raw achievement scores in mathematics and language of SC/ST and non-SC/ST was tested through 't' test. The results presented in Table 2 shows that in mathematics achievement SC/ST students performs less than non-SC/ST students in all the states except in Maharashtra and Tamil Nadu. Whereas, in language, all the states indicated the same results except in Maharashtra. Further, the gap in achievement in both the subjects is the highest in the state of Madhya Pradesh. These findings are not of

# EFFECT OF PUPIL AND SCHOOL LEVEL VARIABLES ON ACHIEVEMENT

much use because it is confounded with the interaction effects of student background and school level factors where students are nested with the school. The following discussions are based on the estimates after controlling for these variables.

TABLE 2  
Comparison of SC/ST and Non-SC/ST Students on Mathematics and Language Achievement (Unadjusted Scores)

States	Group	N	Achievement Scores					
			Mathematics			Language		
			Mean	SD	t	Mean	SD	t
Assam	SC/ST	411	18.91	7.76	3.03**	20.36	7.40	2.84**
	Non-SC/ST	1295	20.17	7.18		21.50	6.97	
Haryana	SC/ST	603	14.14	5.06	5.57**	35.63	11.03	3.62**
	Non-SC/ST	1886	15.53	5.47		37.57	11.59	
Karnataka	SC/ST	594	13.87	7.72	6.09**	14.96	7.16	5.34**
	Non-SC/ST	1974	16.09	7.78		16.75	7.20	
Kerala	SC/ST	351	14.11	5.37	2.72**	18.30	7.42	5.88**
	Non-SC/ST	2738	14.98	5.70		20.99	8.15	
Maharashtra	SC/ST	745	11.40	6.68	1.39	16.56	8.54	.14
	Non-SC/ST	1398	11.81	6.38		16.61	8.29	
Madhya Pradesh	SC/ST	2081	10.61	5.18	6.10**	26.72	14.31	7.09**
	Non-SC/ST	5937	11.44	5.34		29.37	14.77	
Orissa	SC/ST	517	13.47	6.78	5.02**	32.30	12.37	5.75**
	Non-SC/ST	847	15.31	6.40		36.40	12.98	
Tamil Nadu	SC/ST	627	10.98	4.64	1.82	29.29	10.51	3.34**
	Non-SC/ST	1696	11.38	4.64		30.99	10.98	

\*\* Significant at .01 level

## PUPIL BACKGROUND VARIABLES AND ACHIEVEMENT OF SC/ST STUDENTS

The achievement scores contain effects of students' background and school policies and practices. In order to partial out the effects of these factors, the variation in standard scores is split into two components, i.e., within schools and between schools for each state. The within school variance accounts for pupil's background, i.e., students level whereas between school variance contains effects of school policies and practices. A large amount of variance pertaining to pupil level ranges from 39.42 (Karnataka) to 80.44 (Kerala) per cent in mathematics and 54.62 (Madhya Pradesh) to 70.69 (Orissa) per cent in language. The between school variance ranges from 19.55 (Kerala) to 48.89 (Assam) per cent in mathematics and 13.81 (Kerala) to 48.81 (Karnataka) per cent in language. Each of these variances are highly significant. It indicates that in addition to the within school difference there is a significant difference across the schools on mathematics and language scores.

Table 3A represents the achievement gap between SC/ST and non-SC/ST students separately for each state before and after adjusting for all the pupil's background variables. SC/ST variable was constructed by assigning 1 if students belong to SC/ST group and 0 to non-SC/ST. So the estimated effect size is the difference of achievement between SC/ST and non-SC/ST in the respective subjects. It may be observed that gap in achievement for both the subjects between SC/ST and non-SC/ST has decreased uniformly in all the states after adjustment of pupil's background. The reduction is quite noticeable in the state of Assam, Maharashtra and Orissa where the gap in mathematics achievement became not significantly different from zero. Such change of status is observed for only Orissa in the case of language achievement. However, this gap varies across states in both the subjects. Kerala state has recorded the highest gap in mathematics and language, i.e., 23.4 per cent and 38.4 per cent of their respective standard deviations. It may be noted that in Kerala, the within school variances of both the subjects are the highest among all the states. Among the states depicting the statistically significant gap, it is the lowest in the case of Madhya Pradesh in both the subjects (6.1 per cent in mathematics and 7.5 per cent in language of their respective per cent standard deviations).

The variation in the estimated size of the gap in achievement of mathematics and language across states may have a component of sampling variance. In an attempt to adjust for the sampling errors in the estimates of the gap, the meta analysis with known variance is applied separately for mathematics and language (Table 3B). The results indicate that average achievement gap is statistically significant for both in language and mathematics at three per cent and one per cent respectively. The analysis further points out that the variation in the achievement gap across states in mathematics is not statistically significant. On

**TABUL 34**

### SC/ST and Non-SC/ST Achievement Gap in Eight DPET States

[illegible]

### TABLE 3B

### Achievement Gap between SCST and Non-SCST Students Across States (Mean Analysis)

	Mathematics			Language		
	Coeff.	SE	P-Value	Coeff.	SE	P-Value
Av.Ach.Gap	-0.086	.016	.001	-0.101	.041	.03
VARIATION ACROSS STATES						
	Variance	Chi-Sq.	P-Value	Variance	Chi-Sq.	P-Value
Av.Ach. Gap	.0005	10.79	.15	.011	38.43	.001

\*\* Significant at .01 Level \* Significant at .05 Level



the other hand, estimates of gap in language achievement vary significantly across states at one per cent level. These findings indicate that SC/ST students across states score lower than non-SC/ST students by 8.6 per cent of the standard deviation in mathematics. Whereas in language SC/ST students score lower than non-SC/ST students by 10.1 per cent of the standard deviation.

#### SCHOOL VARIABLES AND ACHIEVEMENT OF SC/ST STUDENTS

Further, the achievement gap between SC/ST and non-SC/ST in mathematics does not vary across schools within a state. Whereas, the gap in language achievement

TABLE 4

School Variables Affecting the Achievement Gap of SC/ST and Non-SC/ST Students in the States of Karnataka and Kerala

Karnataka			Kerala		
Effects	Coeff.	SE	Effects	Coeff.	SE
Av. Ach. Gap (Lang)	.008	.054	Av. Ach. Gap (Lang)	-.325**	.063
Teaching Exp.	-.011	.006	Teaching Exp.	-.027**	.012
Physical Facility	.014	.022	Teacher Gives Test	.364**	.111
Pupil Teacher Ratio	-.002	.003	Parent Involvement	-.286*	.135
Primary Grade only	-.113	.115	Operation Blackboard	-.356**	.120
% of Female Teacher	-.004	.003	Free Uniform	-.054**	.021
Parental Involvement	.095	.056	Free Text Book	-.007	.004
Mid-day Meal	-.003	.002			

Variance Across the School	Karnataka				Kerala			
	Variance	df	Chi-Sq.	P-value	Variance	df	Chi-Sq.	P-value
Average Ach. Gap (After Adjusting Pupil Background Variables)	0.115**	106	166.19	.001	0.129*	77	126.36	.001
Average Ach. Gap (After Adjusting Contextual Variables)	0.106**	106	164.54	.001	0.141**	77	122.48	.001
Average Ach. Gap (After Adjusting School Level Variables)	0.086*	98	138.33	.005	0.035	71	79.81	.22

\* Significant at .01 level.

† Significant at .05 level.

varies across schools in the state of Karnataka and Kerala. The analysis of variation in gap for language in the state of Karnataka and Kerala is further carried out to estimate the contribution of school level factors, viz, teacher quality, school resources and academic climate. The results of this analysis is given below.

Results of effects of school level variables on the language achievement gap across schools in Karnataka and Kerala are presented in Table 4. In Karnataka, the variation in the achievement gap reduces from 0.106 to 0.86 after adjusting the effects of school level variables. This variance is statistically significant at five per cent level. It indicates that the factors included in the study are not able to account for the variation in the gap across schools. Further, size of the effects of the school level variables is not statistically significant in the case of all the factors. Only parent involvement is significant at .09 level.

Analysis of achievement gap between SC/ST and non-SC/ST in Kerala state provides all together different trend than that of Karnataka. The reduction in variance due to school level variable is from 0.141 to 0.035. This variance is not statistically significant even at 20 per cent. It indicates that school level variables account for almost whole variation in the achievement gap. Further, among the seven school level variables remained for the study, only one variable, free textbooks does not provide statistically significant contribution. Except the variable teacher gives test along with feedback, all the remaining variables explain the gap significantly and responsible for increase in the gap in achievement. However, the variable, teacher gives test along with feedback, has indicated positive and statistically significant contribution. This contribution is having the highest numerical value and indicates its potential to reduce the gap.

### FURTHER EXPLORATION OF PUPIL BACKGROUND VARIABLES

It is evident from the preceding discussions that gap between SC/ST and non-SC/ST achievement in mathematics do not vary significantly across schools in all the eight states. Only in language achievement, there is an indication of the significant variation between schools in Karnataka and Kerala. It seems that the pupil background variables are the significant indicators of the gap in achievement. Therefore, the achievement scores of SC/ST and non-SC/ST students are analyzed to study the gap in relation to some student background variables. For this purpose, the data of Kerala and Tamil Nadu are further explored. It may be noted that the achievement gap in Kerala is significant whereas in Tamil Nadu it is not significant.

Figure's 1-4 indicate that some SC/ST students score above the school mean and some others score below the mean score in mathematics and language achievement for both the states. Further, socio-economic status of the child is related to the gap in achievement for both the subjects and also in both the states.

# EFFECT OF PUPIL AND SCHOOL LEVEL VARIABLES ON ACHIEVEMENT

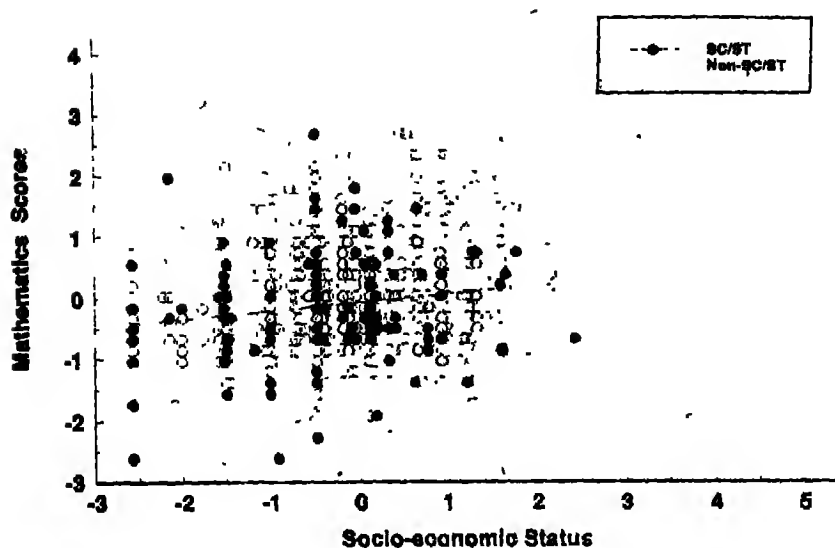


Fig. 1 Relationship of mathematics score with SES of SC/ST and Non-SC/ST students in Kerala

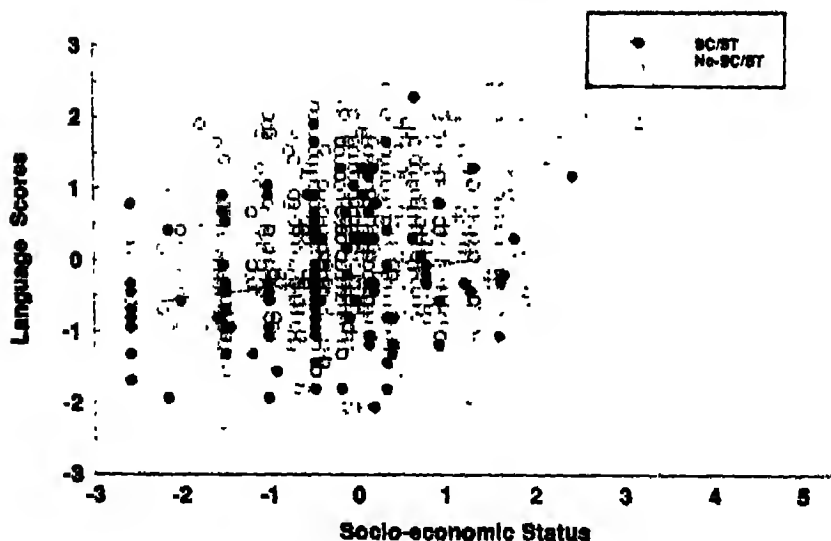


Fig. 2 Relationship of language scores with SES of SC/ST and Non-SC/ST students in Kerala

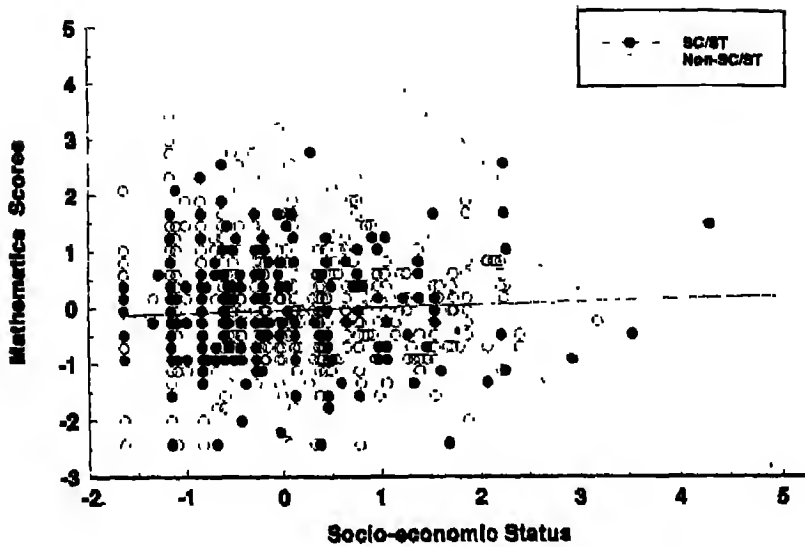


FIG. 3 Relationship of mathematics score with SES of SC/ST and Non-SC/ST students in Tamil Nadu

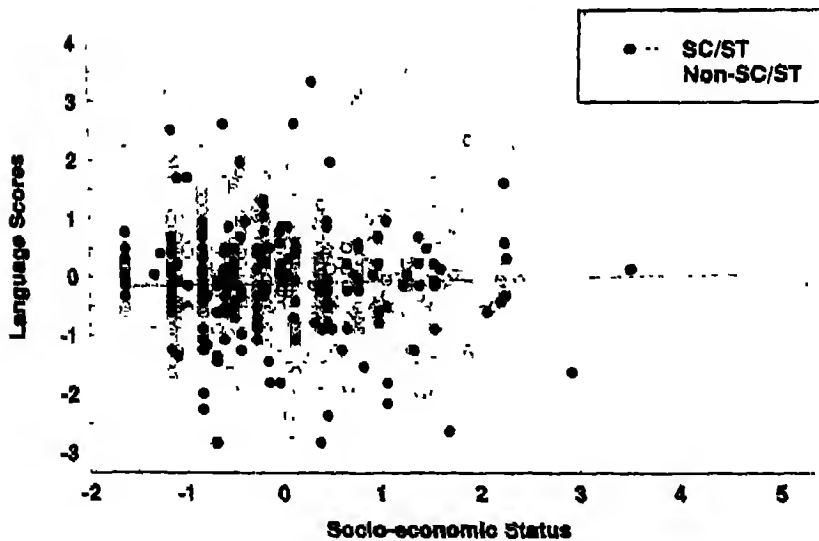


FIG. 4 Relationship of language score with SES of SC/ST and Non-SC/ST students in Tamil Nadu

# EFFECT OF PUPIL AND SCHOOL LEVEL VARIABLES ON ACHIEVEMENT

The gap in achievement increases, as evident by simple regression lines, with the increase in socio-economic status of students. However, the gap for students below mean socio-economic status is almost zero.

The socio-economic status variable is composed of father's education, mother's education and father's occupation. The step-wise multiple regression analysis is undertaken to provide insight into the variation in achievement gap in language and mathematics separately for both the states by taking the constituents of the socio-economic status and repeater as predictor variables.

For the state of Tamil Nadu, the scores in mathematics for SC/ST and non-SC/ST are associated significantly with father's education and explain about one per cent of the variation. Contribution of mother's education and father's occupation and repeater in the case of SC/ST is not statistically significant and the multiple correlation is also not significantly different from zero. However, in the case of non-SC/ST pupil, mother's education does play positive role in the

TABLE 5  
Contribution of Pupil Background Variables (Regression Analysis)

State	Group	Variables	Mathematics				Language			
			Coeff.	R. Square	Change In R Square	Significant Level	Coeff.	R. Square	Change In R Square	Significant Level
Tamil Nadu	SC/ST	Father Edn.	-0.097	0.007	0.007	.04	-0.063	0.002	0.002	.20
		Mother Edn.	-0.039	0.008	0.001	.39	-0.063	0.005	0.003	.19
		Father Occu.	0.002	0.008	0.000	.93	0.042	0.007	0.002	.20
		Repeater	-0.028	0.009	0.001	.48	-0.114	0.020	0.013	.01
	Non-SC/ST	Father Edn.	0.057	0.008	0.008	.001	0.087	0.011	0.011	.001
		Mother Edn.	0.050	0.011	0.003	.02	0.010	0.011	0.000	.45
		Father Occu.	0.053	0.013	0.002	.03	0.058	0.014	0.003	.02
		Repeater	-0.025	0.014	0.001	.30	-0.041	0.016	0.002	.09
Kerala	SC/ST	Father Edn.	0.132	0.020	0.020	.01	0.151	0.031	0.031	.001
		Mother Edn.	0.020	0.020	0.000	.65	0.049	0.034	0.003	.29
		Father Occu.	0.080	0.026	0.006	.14	0.075	0.040	0.006	.14
		Repeater	0.022	0.027	0.001	.67	-0.049	0.042	0.002	.35
	Non-SC/ST	Father Edn.	0.080	0.016	0.016	.001	0.117	0.035	0.035	.001
		Mother Edn.	0.094	0.025	0.009	.001	0.143	0.055	0.020	.001
		Father Occu.	0.096	0.036	0.011	.001	0.098	0.066	0.011	.001
		Repeater	-0.150	0.058	0.022	.001	-0.187	0.101	0.035	.001

\*\* Significant at .01 level

\* Significant at .05 level

enhancement of mathematics achievement. Father's occupation and repeat indicate no such trend. Achievement of SC/ST pupils in language is negatively and significantly related with the repeat variable. Its correlation explaining though low percentage of variation (1.3 per cent) is significantly different from zero. In the case of non-SC/ST students, father's education is positively associated and also statistically significant. Besides this variable, father's occupation is also positively associated with the achievement in language.

As far as mathematics achievement for the state of Kerala is concerned, its association (0.132) is statistically significant only with father's education in the case of SC/ST children. Whereas, non-SC/ST children display stronger relationship between all the predictors and achievement score in mathematics. All the variables are positively associated with mathematics achievement except repeater which is negative and statistically significant. Figure 5 displays distribution of percentage of variation in the achievement score for the predictor variables. The increment in R square in the graph for SC/ST is the same as that of non-SC/ST. The values for non-SC/ST are consistently higher than those of SC/ST students.

Like mathematics, SC/ST students scores in language is associated with only father's education whereas in the case of non-SC/ST all the factors are positively associated except repeater which is having negative but significant value. Further, the amount of variance in achievement scores of SC/ST pupil explained by all the four predictors is only 4 per cent whereas in the case of non-SC/ST, it is 10 per cent. The state of Kerala provides consistent results across mathematics and

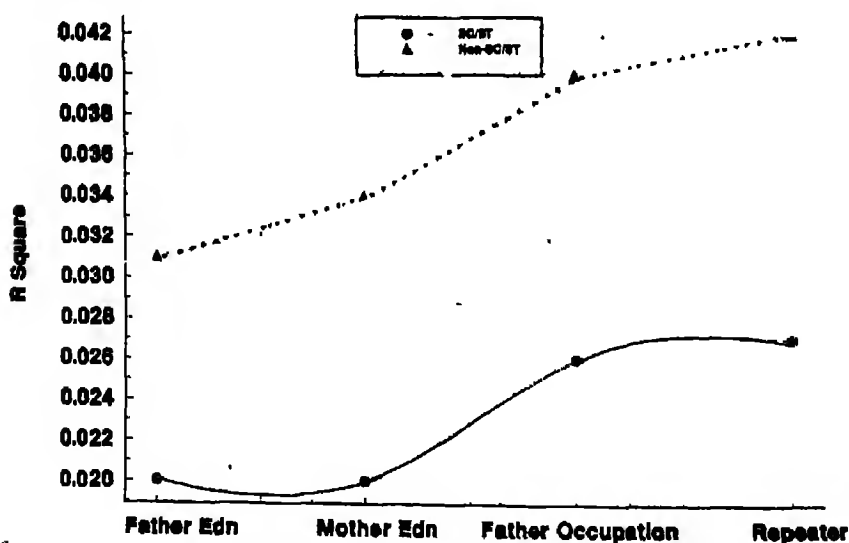


Fig. 5 Contribution of pupil background on mathematics

language within SC/ST or non-SC/ST. Figure 6 depicting the rate of increase in R square vis-a-vis predictor variables for SC/ST and non-SC/ST. Almost the same proportion of variance explained by father's education for SC/ST and non-SC/ST. The position is different with regard to mother's education and repeater. In both the cases, non-SC/ST explains higher proportion of variation than SC/ST due to introduction of these variables in the regression model.

### Summary and Discussion

The present study was based on a sample comprising of 5,292 SC/ST and 17,771 non-SC/ST students of IV/V grade with the intention to find out their achievement differences on mathematics and language. The data collected under Baseline Assessment Studies in eight states was analysed through t-test and ordinary least square regression. To partial out the hierarchical effect on the criterion variables HLM analysis was used. The consistency of achievement differences obtained in each state were checked through meta analysis.

In order to answer the first question, related to achievement difference between SC/ST and non-SC/ST students, t-test results reveal that SC/ST students have significantly low attainment in both language and mathematics in most of

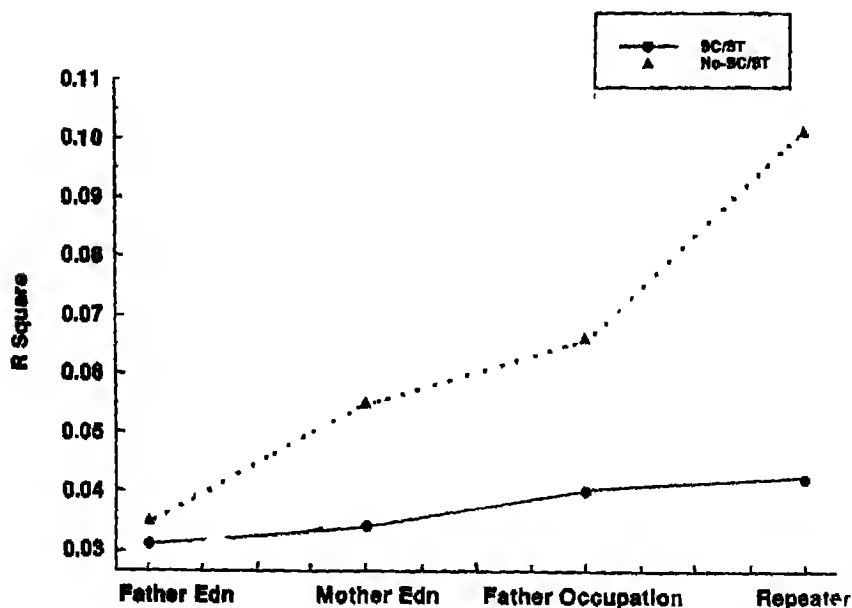


FIG 6 Contribution of pupil background variables on language scores

the states. From HLM analysis it is found that the low attainment level of SC/ST students in mathematics was prevalent in Haryana, Karnataka, Kerala and Madhya Pradesh. In language also, SC/ST students tended to have low attainment in Haryana, Kerala and Madhya Pradesh after controlling for pupil background variables. Further, the result of meta analysis revealed that the negative effect size was consistent across the states in both the subjects. So it is concluded that SC/ST students had low attainment level in comparison to their non-SC/ST counterparts. This finding supports the earlier finding of Shukla (1994).

Regarding variation of negative achievement gap (second question), it was observed that the size of the achievement gap in mathematics did not vary significantly between the schools in any of the states. In Karnataka and Kerala significant differences existed across the school in language scores. It means low attainment of SC/ST students on mathematics is accountable to the effect of home background and pupils' characteristics. Whereas, in language some of the school level variables account for SC/ST achievement gap in Karnataka and Kerala. In the remaining states pupil level variables were the significant indicators. Further probing of pupil background variables revealed that father's occupation and mother's education played a major role in case of non-SC/ST students and may be a cause of low attainment of SC/ST students.

This finding does not contradict the result of earlier studies assessing the effect of home background (Jagannadhan, 1985; Malik, 1984) and SES (Shukla, 1984) on achievement. However, in order to improve the quality of education and plan suitable intervention strategies the school cannot directly influence any home background variables. This is outside the purview of school based intervention. One possibility is that positive attitudes of the parents can be built up through some community oriented programmes. For students who are already in the school, remedial classes should be arranged to compensate for any kind of home based deprivation and negative experiences. In the case of first generation learners or more explicitly those who are yet to enter the formal schooling system, it is necessary to check the secondary consequences of an impoverished home environment. This can be done through provision of stimulating experiences at an early stage, i.e., preschool that will provide an alternative means to facilitate their future educational development. Regarding existing preschool facilities in these states, Rath and Jangira (1995) found that preschool facility was minimum in schools with different levels of concentration of SC and ST students. It is, therefore, vital that this aspect should be given due weightage in any policy implementation resulting in quality education of SC/ST students.

In the context of variables those were identified as crucial school level variables (third question), it was found that parental involvement reduced the SC/ST students' achievement gap in language to some extent in Karnataka. In Kerala, frequency of tests given with a provision for feedback on their performance also



abridged the achievement gap in the same subject. Other variables like teaching experience, parent involvement, Operation Blackboard and free uniform scheme are negatively associated with the language achievement of SC/ST students.

These findings raise various implications for the improvement of quality education at the primary stage. Firstly, the mathematics achievement of SC/ST students was consistently low in most of the states. Therefore, suitable teaching strategies should be adopted in these schools matching the cognitive level of the students. A special focus needs to be given with regard to application of suitable teaching aids along with group learning procedure so as to improve the performance in mathematics. Secondly, in Kerala and Karnataka, teaching experience is negatively associated with the achievement gap. Therefore, in-service teacher training specially focussing on the special needs of SC/ST students will enrich the experience of the teachers. Thirdly, parent involvement in relation to the progress of their children should be encouraged. Fourth, periodic monitoring and evaluation of performance should be planned for all schools accompanied with continuous feedback and ways to improve on that school subject. Fifth, the Operation Blackboard and free uniform scheme in Kerala should be reexamined and monitored for more effective implementation.

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# Effect of State Interventions on Pupil's Achievement

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## ABSTRACT

*This paper attempts to study effects of Operation Blackboard (OB) and incentive schemes on pupil's achievement in mathematics and language. The data collected from 1,746 schools for the Baseline Assessment Studies of DPEP formed the basis of this study. Hierarchical linear model and meta-analysis are used to analyse the data. The OB scheme has shown a positive and significant impact in Assam, Kerala and Madhya Pradesh. The average impact among states is also positive and significant. The items supplied under the OB scheme have also contributed significantly in Haryana, Karnataka and Madhya Pradesh. Supply of free textbooks, and mid-day meals have indicated a positive and significant impact on pupil's achievement in Madhya Pradesh. Whereas scholarship for regular attendance has shown significant impact on language achievement in Kerala.*

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## Introduction

Article 45 enshrined in the Indian Constitution has set a noble goal of providing free and compulsory education to all children up to the age of 14 years. Concerted

efforts have been made by the government through planned schemes to provide educational facilities on universal basis. These efforts were further supplemented by introducing a number of incentive schemes such as mid-day meals, free uniforms, free textbooks, scholarships for regular attendance, etc. A substantial progress has been made since then in providing access to education and enrolling the children. The Fifth All India Educational Survey (NCERT, 1992) has revealed that while primary schooling facility was available to 94.5 per cent of the rural population within a convenient walking distance of one km, only 75.9 per cent of the children of the age group 6 to below 11 years were enrolled in schools. Further, according to Programme of Action (1986) the dropout rate during the year 1985-86 was 47.6 per cent at the primary stage. In spite of the stated achievements, the goal of Universalisation of Elementary Education (UEE) remained unachieved. The National Policy on Education (1986) reaffirmed the national commitment of achieving UEE with the following objectives :

- (i) Universal access and enrolment;
- (ii) Universal retention of children up to 14 years of age;
- (iii) A substantial improvement in the quality of education to enable all children to achieve essential levels of learning.

As conceived in the Programme of Action (1986) the scheme of Operation Blackboard (OB) was launched in the year 1986 to improve school environment. Under this scheme provision was made to provide two reasonably large rooms usable in all weather conditions, at least one more teacher to a single teacher school, toys and games material, blackboards and other learning material.

The District Primary Education Programme (DPEP) was launched in 1993 to further strengthen the efforts of achieving the UEE. To provide a scientific base for launching this programme, the Baseline Assessment Studies (BAS) were undertaken in eight states, viz., Assam, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa and Tamil Nadu. To fulfil the objective of the BAS, it was considered necessary to find out the impact of the OB scheme and incentive schemes on pupils achievement.

The present paper attempts to study :

### Research Questions

- (i) To what extent schools under OB scheme differ from non-OB schools in terms of pupils achievement in Mathematics and language?
- (ii) To what extent incentive schemes influence the achievement of pupils in mathematics and language?

This study uses the data collected for the BAS. The data are analyzed for each of the eight states separately. Since the data are hierarchical in nature, i.e., pupils are nested within schools, use of Hierarchical Linear Model (HLM)

(Bryk and Raudenbush, 1992) in data analysis was considered appropriate to take care of the in-built data structure. The results of different states are synthesized by applying the meta-analysis method with known variance.

### **Review of Related Researches**

To evaluate the OB scheme several studies have been recently conducted by different agencies. Most of these studies (e.g., Gupta and Gupta, 1992; SANDHAN, 1992) attempted to find out the status of the implementation of the OB scheme. The study conducted by Muralidharan *et al.* (1994), however, examined the impact of OB scheme on pupils achievement in different subjects including mathematics and language. This study was confined to Maharashtra and Tamil Nadu states only. The findings of the study revealed that the achievement of OB school pupils in all the subjects covered in the study was significantly higher than those studying in non-OB schools in Maharashtra. Whereas in Tamil Nadu pupils of non-OB schools performed better than their counterparts in OB schools.

The studies conducted in the area of incentive schemes are mainly concerned to assess their impact on enrolment and retention of children in schools. For example, Saxena and Mittal (1985) reported that the Gross Enrolment ratios of boys and girls were higher for the districts having mid-day meals programme than those without the programme. The study did not indicate definite impact of the programme on retention rates of boys and girls.

### **Sample of the Study**

The sample consisted of 1,746 schools, of which 1,045 schools are covered under the OB scheme. These schools were selected from 43 districts of the eight states covered under the BAS. Detailed information about school and pupil characteristics were collected through school and pupil schedules respectively. To estimate achievement of pupils on mathematics and language, standardized achievement tests (Shukla, *et al.*, 1994) were used.

### **Variables Used in the Study**

The input and outcome variables used in this study are defined in Table 1. It may be noted that the dummy and composite variables are either standardized or centered about the sample mean within each state:

### **Impact of Operation Blackboard Scheme**

Before assessing the impact of OB scheme on pupils' achievement it is considered

# EFFECT OF STATE INTERVENTIONS ON PUPIL'S ACHIEVEMENT

TABLE I

## Variables at Pupil and School Levels

<i>S No</i>	<i>Label</i>	<i>Variable Description</i>	<i>Construction of Variable</i>
<b>I Pupil Background Variables</b>			
1.	GIRL	Gender	Girl=1, Boy=0; centered at the pupil level
2.	SCST	Caste	SC or ST=1, Non-SCST=0; centered at the pupil level
3.	DADED	Father education	Applied Logit
4.	MUMED	Mother education	Applied Logit
5.	DADOC	Father occupation	Applied Logit
6.	REPEAT	Ever repeated a class	Repeater=1, non-repeater=0; centered at the pupil level
7.	SBS	Socio-economic status	Composite and standardized
<b>II Contextual Variables</b>			
1.	MEANSES	School Mean SES	Aggregated from pupil to school level; centered at school level
2.	PCTSCST	Per cent SCST	Per cent of SC and ST in the school; centered at school level
<b>III Intervention Variables</b>			
1.	OPBLACK	Operation Blackboard	OB Scheme=1, Non-OB=0, centered at school level
2.	FACIOP	Material available under OB scheme	Available=1, Not Available=0; Added all available items; centered at school level
3.	MDMEAL	Mid-day Meals	Percentage of beneficiaries; centered at school level
4.	UNIFORM	Free Uniforms	Percentage of beneficiaries; centered at school level
5.	TEXTBOOK	Free Textbooks	Percentage of beneficiaries; centered at school level
6.	SRATTEND	Scholarship for regular attendance	Percentage of beneficiaries; centered at school level
7.	OSCHOLAR	Other Scholarship	Percentage of beneficiaries; centered at school level

worthwhile to compare the mean achievement scores of OB and non-OB schools. Table 2 gives the mean and standard deviation (S.D.) of language and mathematics achievement scores of pupils in OB and non-OB schools.

# EFFECT OF STATE INTERVENTIONS ON PUPIL'S ACHIEVEMENT

TABLE 2

Mean and S.D. of Pupils' Achievement Scores

Sl No.	State	School Type	Number of Schools	Maths Scores			Language Scores		
				Mean	S.D.	t	Mean	S.D.	t
1	Assam	OB	74	19.93	5.00	2.13	21.79	5.13	2.93
		Non-OB	87	18.02	6.19		19.60	4.39	
2	Haryana	OB	109	14.91	3.26	0.90	36.90	7.20	0.52
		Non-OB	35	15.48	3.05		37.65	8.14	
3	Karnataka	OB	88	15.21	6.53	0.30	16.01	5.74	0.18
		Non-OB	88	14.93	6.07		15.86	5.07	
4	Kerala	OB	54	15.66	2.15	2.62	21.21	3.39	1.40
		Non-OB	59	14.36	3.00		20.33	3.31	
5	Madhya Pradesh	OB	395	11.05	4.06	2.05	28.76	10.88	3.43
		Non-OB	138	10.45	3.77		26.00	10.86	
6	Maharashtra	OB	95	10.83	4.67	2.04	15.43	5.72	2.4
		Non-OB	40	12.67	5.01		17.87	5.92	
7	Orissa	OB	136	13.53	5.47	0.02	32.87	8.83	0.66
		Non-OB	29	13.50	4.98		34.13	11.40	
8	Tamil Nadu	OB	94	10.96	3.00	0.01	30.32	6.99	0.70
		Non-OB	24	10.97	2.50		29.24	5.52	

The mean achievement of OB schools is significantly higher than that of non-OB schools in the states of Assam and Madhya Pradesh in both mathematics and language. In Kerala, although the mean achievement of OB schools is higher for both the subjects, it is significant ( $t = 2.62$ ) for mathematics only. In Maharashtra, however, the mean performance of non-OB schools is higher and significant than that of OB schools in both the subjects. No significant difference is observed between the mean achievements of OB and non-OB schools in the remaining states.

We now examine the impact of OB scheme on pupils' achievement. Three input-process-output models (Willms, 1992) are used to analyze the data. Using broad terms, the models are described below:

## Model 1

Pupil's achievement score = the average score of all pupils  
+ the effects of pupil background

## EFFECT OF STATE INTERVENTIONS ON PUPIL'S ACHIEVEMENT

- + the effect of OB scheme
- + any unmeasured effects unique to the child's school
- + random error

### Model 2

- Pupil's achievement score = the average score of all pupils
- + the effect of pupil background
  - + the effects of MEANSES+PCTSCST
  - + the effect of OB scheme
  - + any unmeasured effects unique to the child's school
  - + random error

### Model 3

- Pupil's achievement score = the average score of all pupils
- + the effect of pupil background
  - + the effects of MEANSES+PCTSCST
  - + the effect of OB scheme + FACILOP
  - + any unmeasured effects unique to the child's school
  - + random error

Table 3 presents the results of the analysis based on the three models. Columns 4 and 7 of the table show the estimated effect size of the OB scheme on mathematics and language achievement respectively. These models use standardized achievement scores in mathematics and languages as the dependent variables.

Let us first consider results of Model 1 which provide us estimates of the effect of OB scheme in the school, after adjusting for the effects of pupil background variables. It is evident from the table that there is a substantial gap in the performance of OB and non-OB schools on both mathematics and language achievements in the states of Assam, Kerala and Madhya Pradesh. The estimated achievement gap is statistically significant at less than .05 level in Kerala and Madhya Pradesh and at less than .10 level in Assam. It implies that in these states, on average, pupils in OB schools perform better than their counterparts in non-OB schools in both the subjects. The table further reveals that the OB scheme improves the mean performance of schools on mathematics achievement by 19.3 per cent, 26.6 per cent and 13.2 per cent of their respective standard deviations in Assam, Kerala and Madhya Pradesh respectively. The corresponding percentages for language achievement are 27.5, 16.1 and 22.2. It indicates that the OB scheme did have a discernible impact on the mathematics and language achievement in these three states.



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TABLE 3

## Effect of Operation Blackboard Scheme on Pupils' Achievement

State	Model	Factor	Mathematics			Language		
			Coeff.	SE	P	Coeff	SE	P
Assam	1	OPBLACK	.193	.116	.097	.275	.099	.006
	2	OPBLACK	.190	.117	.105	.262	.100	.009
	3	OPBLACK	.199	.152	.192	.340	.129	.009
		FACIOP	-.002	.018	.912	-.015	.015	.332
Haryana	1	OPBLACK	-.110	.114	.336	-.113	.099	.254
	2	OPBLACK	-.089	.113	.432	-.091	.122	.455
	3	OPBLACK	-.204	.131	.118	-.238	.140	.089
		FACIOP	.026	.015	.070	.033	.016	.036
Karnataka	1	OPBLACK	.058	.120	.626	.059	.110	.589
	2	OPBLACK	.065	.125	.605	.109	.111	.327
	3	OPBLACK	.023	.124	.854	.085	.112	.445
		FACIOP	.039	.013	.004	.021	.012	.069
Kerala	1	OPBLACK	.266	.089	.003	.161	.079	.042
	2	OPBLACK	.234	.084	.006	.098	.071	.164
	3	OPBLACK	.199	.099	.044	.067	.083	.423
		FACIOP	.008	.011	.497	.009	.009	.360
Madhya Pradesh	1	OPBLACK	.132	.053	.013	.222	.053	.000
	2	OPBLACK	.133	.053	.012	.220	.053	.000
	3	OPBLACK	-.068	.070	.331	.026	.070	.715
		FACIOP	.025	.006	.000	.024	.006	.000
Maharashtra	1	OPBLACK	-.233	.132	.077	-.238	.122	.051
	2	OPBLACK	-.146	.132	.267	-.174	.123	.157
	3	OPBLACK	-.050	.137	.738	-.087	.128	.496
		FACIOP	-.031	.014	.023	-.026	.013	.040
Orissa	1	OPBLACK	.059	.148	.690	-.089	.124	.474
	2	OPBLACK	.067	.145	.643	-.088	.121	.468
	3	OPBLACK	-.043	.209	.836	-.215	.175	.220
		FACIOP	.013	.017	.463	.014	.015	.340
Tamil Nadu	1	OPBLACK	.033	.142	.814	.090	.141	.524
	2	OPBLACK	.004	.151	.980	.060	.151	.690
	3	OPBLACK	.237	.208	.257	.103	.211	.623
		FACIOP	-.028	.016	.082	-.006	.016	.726

## EFFECT OF STATE INTERVENTIONS ON PUPIL'S ACHIEVEMENT

In the remaining states there is no evidence of OB scheme having any significant impact on pupils' achievement in both the subjects. However, OB schools do perform slightly better than non-OB schools in Karnataka (in both mathematics and language) and Orissa (in mathematics only). In Haryana and Maharashtra, the mean performance is relatively low in OB schools as compared to non-OB schools. The estimated effect size is statistically significant at .10 level for Maharashtra only.

Model 2 adds school contextual variables, viz., school mean SES and proportion of SC/ST in the school, to the input variables of Model 1. The analysis gives the estimated effect of the OB scheme on school mean achievement, after adjusting for the pupil background and the school contextual variables.

The achievement gap between OB and non-OB schools reduces and becomes insignificant at .10 level, after adjusting for the contextual variables, in Kerala on language achievement and in Assam on mathematics achievement. Further, the gap is still highly significant in Assam on language achievement and in Kerala on mathematics achievement. In Madhya Pradesh, the gap between OB and non-OB schools is significant at less than .05 level on both mathematics and language achievement.

In Maharashtra, where the gap between OB and non-OB schools was

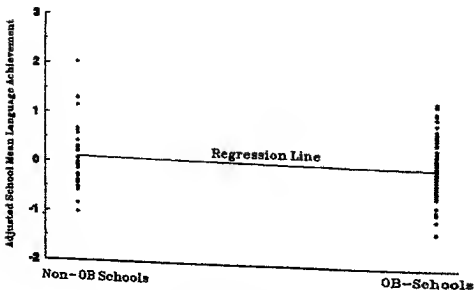


FIG. 1 Effect of OB scheme on language achievement  
(Maharashtra)

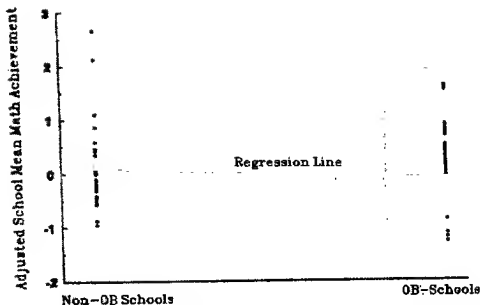


FIG. 2 Effect of OB scheme on mathematics achievement (Maharashtra)

significant at less than .10 level before modeling the school contextual variables becomes insignificant after adjusting for the effect of these variables.

We now examine the effect of OB scheme on school mean achievement graphically. For this purpose two states, viz., Maharashtra indicating no impact and Kerala showing significant impact of the scheme, are chosen. The graphs are presented for Maharashtra in Figures 1 and 2 and for Kerala in Figures 3 and 4. In the figures, school mean achievement scores are plotted on the ordinate against OB and non-OB schools shown on the abscissa.

Figures 1 and 2 show a downward regression line indicating low performance of OB schools than that of non-OB schools. The figures clearly indicate that the performance of a few non-OB schools is much above the state average whereas a few OB schools are performing much below the average. It appears that probably the impact of OB scheme on achievement in Maharashtra is not visible due to these few schools.

Figures 3 and 4 indicate an upward regression line both for mathematics and language achievement in Kerala, the OB schools performing higher. However, there are a few OB schools that are performing much below the average.

Table 4 presents the estimated achievement gap between OB and non-OB schools across the states.

# EFFECT OF STATE INTERVENTIONS ON PUPIL'S ACHIEVEMENT

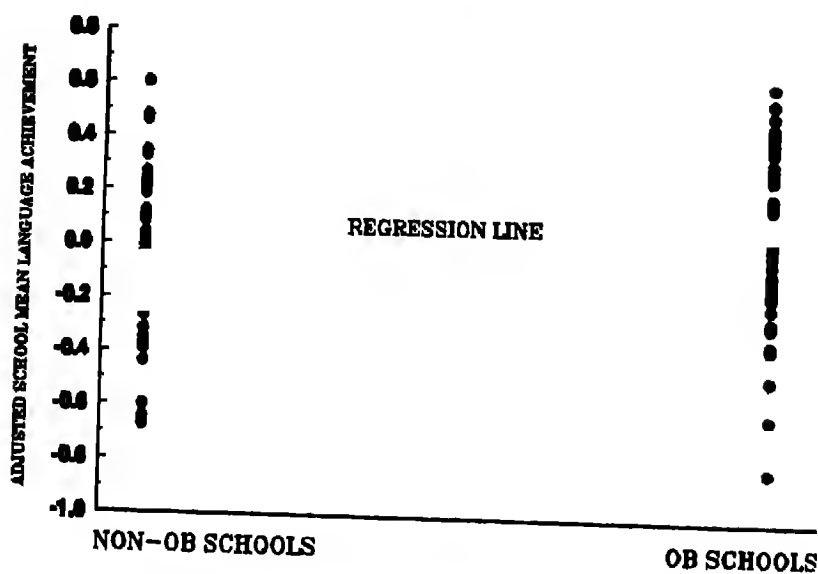


Fig. 3 Effect of OB scheme on language achievement (Kerala)

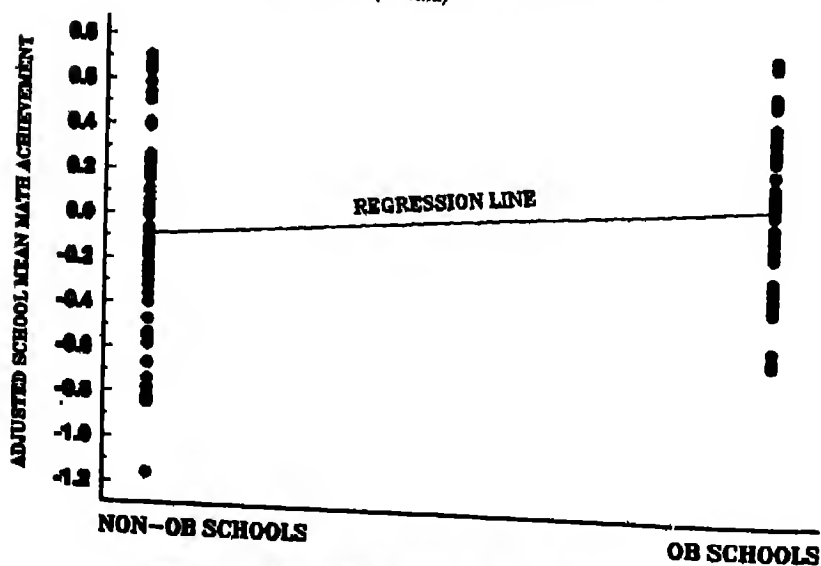


Fig. 4 Effect of OB scheme on mathematics achievement (Kerala)

TABLE 4

## Achievement Gap between OB and Non-OB Schools across States

## (Meta-Analysis)

	Mathematics			Language		
	Coeff.	SE	P-value	Coeff.	SE	P-value
Average Achievement Gap	0.091	0.039	0.04	0.095	0.051	0.075
<i>Random Variation Across States</i>						
	Variance		P-value	Variance		P-value
Average Achievement Gap	0.004		0.142	0.010		0.029

The meta-analysis of the effect sizes of all the eight states indicates that the average achievement gap between OB and non-OB schools in mathematics and language is 0.091 and 0.095 respectively, the OB schools performing higher. These achievement gaps are statistically significant at .05 and .10 level respectively. It further indicates that while there is no variation among the states on average achievement gap in mathematics between OB and non-OB schools, there is a significant variation ( $p < .05$ ) among the states on language achievement gap.

The model 3 includes FACIOP, material available under the OB scheme, as an additional variables to model 2. Thus, the analysis of this model gives the estimated effect of OB scheme and FACIOP.

It is observed from Table 3 that the effect of FACIOP is positive in Haryana, Karnataka and Madhya Pradesh although the effect of OB scheme in Haryana and Karnataka is not significant. It is interesting to note that on modeling FACIOP, the effect of OB scheme becomes insignificant in Madhya Pradesh whereas it was highly significant before. It indicates that FACIOP, which is one of the major components of OB scheme, is responsible for enhancing pupils' achievement.

### Effect of Incentive Schemes

A number of incentive schemes are in force to enrol and retain children in schools. These schemes may not have direct impact on performance of pupils but are likely to have indirect impact. There are five schemes whose impacts are studied in this paper. The estimated effects of these schemes are presented in Table 5.

*Mid-Day Meals:* Supply of mid-day meals to students in schools has

## EFFECT OF STATE INTERVENTIONS ON PUPIL'S ACHIEVEMENT

TABLE 5

## Effect of Incentive Schemes on Pupils' Achievement

State		M-D Meals	Uniform	Textbook	Attendance	Scholarship
MATHEMATICS						
Assam	Coeff. SE	N.A.	-.006 .004	.000 .003	.034 .031	.025 .121
Haryana	Coeff. SE	N.A.	.001 .005	-.001 .003	-.003 .004	-.002 .003
Karnataka	Coeff. SE	-.000 .002	-.001 .003	-.006 .004	-.000 .004	.001 .010
Kerala	Coeff. SE	-.001 .001	-.030 .022	-.003 .003	.008 .004	.000 .003
Madhya Pradesh	Coeff. SE	-.001 .001	-.001 .001	.003 .001	-.006 .001	.000 .004
Maharashtra	Coeff. SE	-.004 .004	.002 .003	-.004 .003	.005 .006	.018 .024
Orissa	Coeff. SE	-.002 .010	.004 .005	-.001 .002	-.071 .170	-.010 .010
Tamil Nadu	Coeff. SE	-.004 .004	.002 .004	-.003 .006	-.005 .007	-.002 .004
LANGUAGE						
Assam	Coeff. SE	N.A.	-.005 .003	.000 .003	.051 .026	-.022 .101
Haryana	Coeff. SE	N.A.	.002 .004	-.002 .003	-.001 .003	.001 .003
Karnataka	Coeff. SE	-.001 .002	.002 .003	-.006 .003	.002 .004	-.002 .009
Kerala	Coeff. SE	-.001 .001	-.024 .022	.002 .003	.008 .004	-.000 .003
Madhya Pradesh	Coeff. SE	.002 .001	.001 .001	.003 .001	-.005 .001	.004 .004
Maharashtra	Coeff. SE	-.001 .003	.001 .003	-.001 .002	.006 .006	.006 .023
Orissa	Coeff. SE	.007 .009	.002 .004	-.002 .002	.104 .137	-.008 .009
Tamil Nadu	Coeff. SE	-.002 .004	.000 .004	-.002 .006	-.002 .007	-.003 .004

N.A. — Incentive scheme is not available.

significant positive effect on language achievement in the schools of Madhya Pradesh. Increase in beneficiaries by 1 per cent results into increase of 0.002 units in the performance of pupils on language achievement. In other states, the scheme has not shown any impact on pupils' language and mathematics achievement.

*Free Uniforms:* Supply of free uniforms to students in schools has not indicated any effect on achievement in any of the eight states.

*Free Textbooks:* Supply of free textbooks to students has a positive and significant effect on both mathematics and language achievement of pupils in the schools of Madhya Pradesh. Increase in number of beneficiaries in a school by 1 per cent would enhance the school mean achievement by 0.003 units in both the subjects.

*Attendance Scholarship:* Provision of scholarship for regular attendance in schools has a positive and significant effect on both mathematics and language achievement in Kerala. The mean achievement of schools in Kerala would increase by 0.008 units in both the subjects with 1 per cent increase in the number of beneficiaries. No impact of this scheme is visible in the remaining states.

The above discussion indicates that supply of free textbooks has a positive and significant impact on both mathematics and language achievement in Madhya Pradesh whereas provision of mid-day meals in schools has such effect on language achievement only. In Kerala, attendance scholarship tends to increase the school mean achievement.

### Summary of Findings

This paper deals with the problem of estimating effects of the OB and incentive schemes on pupils achievement in mathematics and language. The input-process-output model has been used to analyse the data. It may be noted that the school level predictors describing school policies and practices are weak because the study was designed with several purposes in mind. Variables depicting the efficacy of OB and incentive schemes are not measured in sufficient detail, and the distribution of some variables is such that one cannot achieve powerful estimates of the effects. For example, in most states the majority of schools receive some sort of incentive schemes. Thus this is not a sufficient sample of "non-scheme" schools to yield an accurate estimate of the effects of incentive schemes. The findings of the study may be viewed in this background.

The major findings of the study are as follows:

1. The OB scheme has shown a positive and statistically significant impact on mathematics and language achievement in the states of Assam, Kerala and Madhya Pradesh, after controlling for the effects of pupil background variables.
2. The effect size of the OB scheme on mathematics and language achievement is found to be positive but not statistically significant in the states of Karnataka, Orissa and Tamil Nadu.

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3. In Haryana and Maharashtra, the mean performance is relatively low in OB schools as compared to non-OB schools.

4. The effect size of the OB scheme becomes insignificant, after controlling for the effects of contextual variables, in Assam on mathematics achievement, in Kerala on language achievement, and on mathematics and language achievement in Maharashtra.

5. The meta-analysis carried out on the results of all the eight states has shown a positive and significant impact of the OB scheme on the average achievement in both mathematics and language. It implies that, by and large, OB scheme has a positive impact on learner's achievement.

6. The items supplied under the OB scheme have contributed significantly towards improving the pupils achievement in the states of Haryana, Karnataka and Madhya Pradesh.

7. Supply of free textbooks has positive and significant impact on both mathematics and language achievement in Madhya Pradesh whereas provision of mid-day meals in schools has such effect on language achievement only. Scholarship for regular attendance has a positive and significant impact on language achievement in Kerala.

### Implications

1. The OB scheme has shown a positive and statistically significant impact on pupils' achievement in some of the states. Further, the magnitude of impact varies from state to state. In view of the results, the OB scheme needs to be strengthened and expanded.

2. Further, it seems that the material supplied to the schools have not been frequently used by the teachers. In order to make use of the material effectively, specific teacher training programmes may be planned for the purpose.

3. The incentive schemes basically enhance enrolment and retention of the children in schools. These schemes have shown weak indications for their associations with achievement in most of the states. The strengthening of these schemes may perhaps help in improving the student achievement.

### ACKNOWLEDGEMENT

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# Inputs in Primary Schools with Different Levels of Concentration of Scheduled Tribe Students

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## ABSTRACT

*The present study focuses on the school input differences in the primary school with different levels of concentration of ST students. The data of Baseline Assessment Study of six states comprising 1,502 schools are analysed. The input variables like physical facilities and services, coverage by OB scheme and instructional aids, teacher quality and teaching patterns were treated through non-parametric statistical technique. It was found that in some of the states, schools with high concentration of ST students had less pucca building facilities, availability of furniture and equipments, safe drinking water and toilet facilities, instructional aids, pre-school facilities, more under-qualified teachers, less number of days of inservice training, less experienced teachers and more use of multigrade teaching.*

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## Context and Focus

Scheduled Tribes constitute disadvantaged segment of population in India. Scheduled Caste population is scattered all over because of the job sharing prevalent in the caste system in India. Scheduled Tribes have a variety of scatter. There are locations which are totally inhabited by tribal communities. They live

in tribal groups. Tribal groups in some of the areas have integrated with the rest of the communities in some areas due to mobility engineered by development or natural disasters. Tribal communities are represented in small measure in non-tribal areas through organized employment.

The educational development of tribal communities also followed a different course affecting their development. For example, in tribal population, the development is preceded by intensive education development. So the tribal communities are relatively better on quality of life indicators. The situation however is different in plains. The education remains low among the tribal communities and the development activities pushed them further due to their withdrawal tendency to preserve their culture. Despite positive discrimination and special attention of the state and central governments, education and economic levels remain low.

The Baseline Assessment Study on learning achievement indicates low level of performance and high rate of drop-out among tribal students. With reference to their achievement as reported in the Baseline Assessment Study, the mean score of mathematics and language varies from 5 to 19 and 9 to 24 respectively (Jangira *et al.*, 1994). Also the poor performance of SC/ST children in mathematics is reported by HLM analysis in the state of Tamil Nadu (Rath & Saxena, 1995). The school inputs therefore assume significance. Do inputs differ in schools with different concentration of tribal children? It is a logical

## STATE

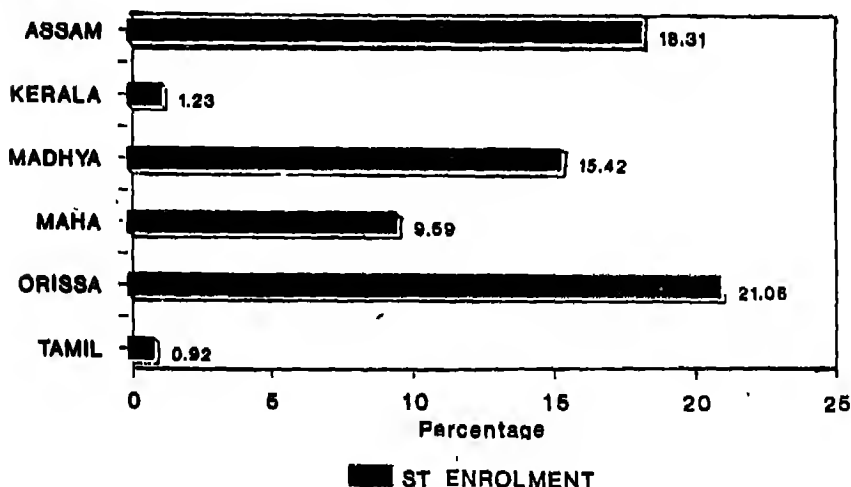


FIG 1 Total percentage of ST enrolment in primary schools

question. The present study based on the reanalysis of the Baseline Assessment Study on learning achievement seeks to answer this question.

### Coverage

Micro-analysis of Baseline Assessment Study on learning achievement conducted in DPEP districts was carried out to investigate the status of inputs in primary schools with different levels of concentration of ST students. The total percentage of ST enrolment in primary schools of respective states were calculated prior to find out their concentration level in the selected schools included for investigation. As shown in Fig. 1, high percentage of ST enrolment is in Orissa whereas, it is quite low in Tamil Nadu. The number of districts, schools covered and the total percentage of ST enrolment in the states are given in Table 1.

TABLE 1  
The Number of Districts and Schools

State	*Total % of Enrolment	Number of Districts	Number of Schools
Assam	18.31	4	161
Kerala	1.23	3	113
Madhya Pradesh	15.42	19	808
Maharashtra	9.59	3	135
Orissa	21.06	4	165
Tamil Nadu	.92	3	120
Total		36	1502

\* Source : Selected Educational Statistics on Sept. 1993  
(Studies in Educational Statistics No 5) MHRD, 1994

### Variables

The variables involved in the study are "ST concentration index" and "school inputs". The school inputs were classified. The school building and services covered ownership of the building, type of building, additional requirement of classroom, availability of playground, safe drinking water, toilet facilities, furniture and equipment. The coverage of the school by OB scheme and instructional aids also form a component of the physical facilities. Preschool and incentive schemes to children were also covered. Another significant category relates to teacher quality which covers education and professional training. The latter includes initial training, inservice training and teacher experience. Multi-grade teaching, teacher attendance and teacher-pupil ratio also fall in this

# INPUTS IN PRIMARY SCHOOLS WITH DIFFERENT LEVELS OF CONCENTRATION

TABLE 2  
Variables Covered in the Study

<i>Variables</i>	<i>Code</i>	<i>Variable Description</i>	<i>Statistics Used</i>
<b>School Building and Services</b>			
Building	BDGO	% Own Building	Chi-Square
Pucca Building	BDGPC	% Building	-do-
Additional Classroom	ADCL	Numbers of classroom	K-W ANOVA
Furniture and Equipments (Total 9 items)	FEQT	Numbers of FEQT available	-do-
Playground	PLG	% Schools having playground	Chi-square
Safe Drinking Water	SDW	% schools having SDW facilities	-do-
Toilet	TLT	% schools having TLT facilities	-do-
<b>OB Coverage</b>			
OB Scheme	OB	% of schools covered by OB	-do-
Instructional Aids	INAD	Numbers of INAD available	K-W ANOVA
<b>Pre-school and Incentives</b>			
Pre-School Facility	PSC	% of schools having PSC facilities	Chi-square
Pupil Incentive	PINC	% of schools having PINC	-do-
<b>Teacher Quality</b>			
Academic Qualification	AQUAL	8th=1, Matric=2, H.S =3, Grad=4, PG=5	K-W ANOVA
Below Class X	BLX	Mean % of BLX	K-W ANOVA
Initial Training	INTR	Mean % of INTR	K-W ANOVA
Inservice Training	INSET	Number of Days	K-W ANOVA
Teaching Experience	TEXP	Number of Years	K-W ANOVA
Multigrade Teaching	MGT	% of Teachers adopt MGT	K-W ANOVA
Teacher Attendance	TAT	Always=1, Max.time=2, Sometime=3, Very few=4	K-W ANOVA
Teacher-Pupil Ratio	TPR	Ratio	K-W ANOVA
<b>Teaching Pattern</b>			
Total Hours Devoted to Teaching	HRT	Hours	K-W ANOVA
Time for Talking With	TLK	Minutes	K-W ANOVA

# INPUTS IN PRIMARY SCHOOLS WITH DIFFERENT LEVELS OF CONCENTRATION

Variables	Code	Variable Description	Statistics Used
<b>Pupil</b>			
Time for Group Learning	GRL	Minutes	K-W ANOVA
Time for Practice	PRACT	Minutes	K-W ANOVA
Time for Home Work	HCRT	Minutes	K-W ANOVA
<b>Correction and Feedback</b>			
Home Work Given	HWG	Regularly=1, Sometime=2 Not at all=3	K-W ANOVA
Teacher Reads Textbook	TXTR	Mean Yes	K-W ANOVA
Child Reads Aloud	CHR	Mean Yes	K-W ANOVA
Child Self Reads	CHRS	Mean Yes	K-W ANOVA
Textbook Home Work	HTXT	Mean Yes	K-W ANOVA

category. Teaching patterns constitute another dimension of inputs to schooling. It covers time for teaching, time for talking with pupils, group learning practice, home work, opportunity to read aloud and the use of textbooks. Health facilities include availability of first-aid kits, provision of health check-up and immunization. The variables along with variable description and statistics used are summarized in Table 2.

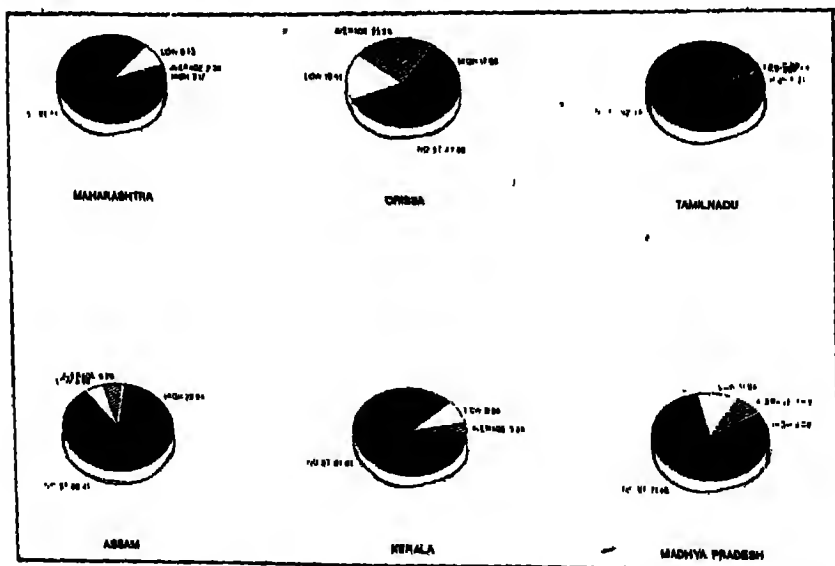


FIG 2 Percentage of schools in different category of ST concentration

# ST Concentration Index (STI)

An index indicating the concentration level of ST students in primary schools was constructed. Percentage of ST students in each school was worked out and frequency distribution for each state was investigated. Schools having 75-100 per cent enrolment of ST students was considered as the high concentration group. The enrolments of 50-74 and 25 to 49 per cent were categorized into average and low concentration group respectively. High and average groups were major focus in this study because these schools may be equipped with more facilities due to various beneficial programmes launched by the Ministry of Human Resource Development. The fourth category consists of 0-24 per cent of enrolment where percentage of schools without any ST students were mentioned. To level this percentage (1-24 per cent) of ST children may not be meaningful as they are functionally integrated with other students in the school system. The percentage of schools fall under each category is presented in Fig. 2. The procedure was applied to each of the states. The description of schools in different categories is given in Table 3.

TABLE 3  
Number of Schools

State	High Concentration (75-100%)	Average Concentration (50-74%)	Low Concentration (25-49%)	No ST (0-24%)	Total**
Assam	36	10	9	104 (86.5)*	159
Kerala	0	4	10	99 (69.7)	113
Madhya Pradesh	69	58	90	543 (36.1)	760
Maharashtra	4	3	11	108 (34.3)	126
Orissa	29	25	32	78 (16.7)	164
Tamil Nadu	6	2	1	104 (73.1)	113
Total	144	102	153	1036	1435

\* Parenthesis value shows the percentage of schools not having ST students

\*\* Missing cases are excluded

## Statistical Analysis

The distribution of ST enrolment percentage in each state indicated a negative skewed distribution. Therefore Non-Parametric statistics were used for studying the significance of difference between the levels of inputs in schools in the four

## INPUTS IN PRIMARY SCHOOLS WITH DIFFERENT LEVELS OF CONCENTRATION

categories. For the variables with dichotomous response like ownership of school building, pucca and other buildings, etc., Chi-square was used. For variables which had continuous scores achieved through aggregation of items or scaling, Kruskal-Wallis One Way Analysis of Variance (K-W ANOVA) was used. In this statistics each observation is replaced by ranks. The lowest value is replaced with rank 1, and the highest value with total number of cases in the observation. To test the significance of difference, group mean ranks are compared by obtaining a Chi-square value. However in the tabular presentation, mean and SD of respective variables are presented in place of mean ranks for meaningful interpretation. Only Chi-square value obtained from K-W ANOVA with its probability level are mentioned against the mean and SD. Mann-Whitney U-test was applied to find out significance of difference between different pairs of means. The power-efficiency of these two tests are 95.5 per cent when compared to F and t-test respectively (Siegel, 1956).

### Results

#### SCHOOL BUILDING

Table 4 represents the percentage of schools in different categories having own building and pucca building facilities. The results reveal no significant difference among the four categories of schools in respect of buildings except in Madhya Pradesh. In Madhya Pradesh the schools with high concentration of ST students had significantly higher percentage of own buildings than no ST groups. Whereas average concentration group lacked pucca building facilities in comparison to other three groups. High concentration group lagged behind 20 per cent of pucca

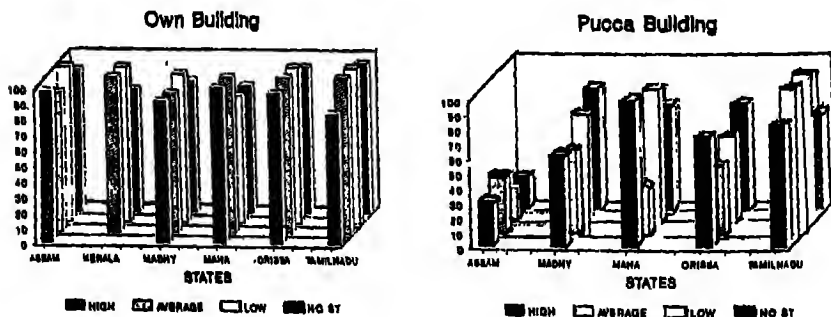


FIG. 3 Schools having building facilities



# INPUTS IN PRIMARY SCHOOLS WITH DIFFERENT LEVELS OF CONCENTRATION

building facilities in comparison to no ST group. Though the P-value were not significant in case of other states but schools with high concentration of ST students were equipped with better building facilities (Fig.3). The special facilities for tribal areas under the tribal sub-plan and assistance from the Ministry of Welfare might have helped.

TABLE 4  
School Building

State	School Facility	Percentage of Schools having the Facility				Chi-Square	P-Value
		High Conc.	Average Conc.	Low Conc.	No ST		
Assam	Building	97.2	90.0	100	91.3	2.26	.52
	Pucca Building	30.6	40.0	22.2	22.1	2.28	.52
Kerala	Building	N.A	100	100	78.8	3.65	.16
	Pucca Building	N.A	N.A	N.A	N.A	N.A	NA
Madhya Pradesh	Building	91.3	89.7	95.6	84.5	10.12	.02*
	Pucca Building	62.3	58.6	73.3	82.5	29.89	.001**
Maharashtra	Building	100	100	81.8	81.5	1.57	.67
	Pucca Building	100	33.3	90.9	72.2	5.77	.12
Orissa	Building	96.6	100	100	93.6	3.48	.28
	Pucca Building	75.9	48.0	59.4	73.1	7.26	.06
Tamil Nadu	Building	83.3	100	100	96.2	2.35	.50
	Pucca Building	83.3	100	100	66.3	2.19	.53

## ADDITIONAL CLASSROOM, FURNITURE AND EQUIPMENT

Regarding availability of physical facilities, Table 5 includes the analysis of additional classroom required and existing furniture and equipment facilities in

## INPUTS IN PRIMARY SCHOOLS WITH DIFFERENT LEVELS OF CONCENTRATION

the schools under these four categories. Practically the requirement of extra classroom was not very different among the four groups which is especially dependent on size of the class. In the context of furniture and equipment facilities, low concentration group in the State of Maharashtra, average concentration group in Orissa ( $Z=-3.03$ ,  $P<.01$ ), and high group in Tamil Nadu ( $Z=-2.13$ ,  $P<.03$ ) fall behind the no ST group (Fig. 4). On an average, the schools under no ST group had more furniture than those with high density of ST students (Table 5). More schools had building (Table 4), but less had furniture and equipments. Is it due to lack of supplies or due to culture of not using furniture is a question needing further investigation.

### PLAYGROUND, DRINKING WATER AND TOILETS

In Madhya Pradesh the differences in the schools having playground was significant but more schools with average concentration of ST students have more playgrounds than schools under no ST group. The playground facilities in schools of Maharashtra and Orissa covered in this study were below 50 per cent which is not only specific to schools with ST students. In Madhya Pradesh 36 per cent of school with high concentration of ST students were provided with safe drinking water facilities which was significantly less than low concentration group. In Assam, Maharashtra and Orissa however these facilities were available in less quantity for all schools. Toilet facilities were very poor in all the states except

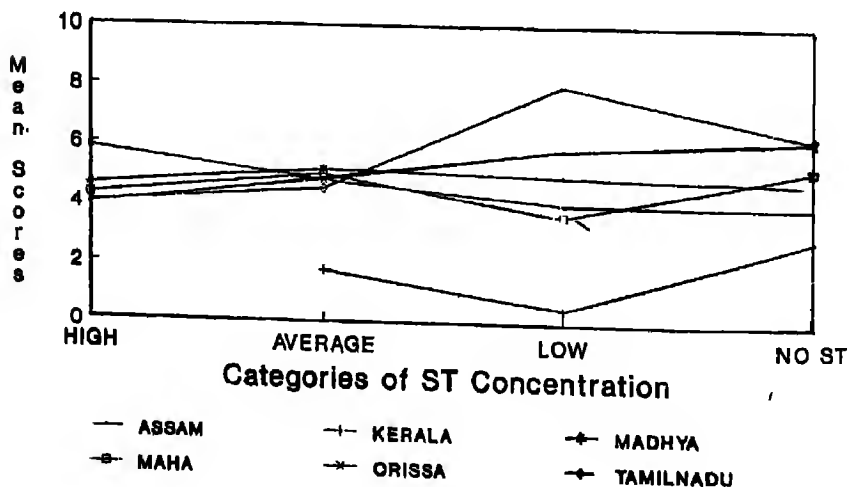


FIG. 4 Furniture and equipments available

# INPUTS IN PRIMARY SCHOOLS WITH DIFFERENT LEVELS OF CONCENTRATION

TABLE 5

## Classrooms, Furniture and Equipment

State	School Facility	Mean Standard Deviation of Schools Having the Facilities									
		High Conc. Mean	High Conc. S.D.	Average Conc. Mean	Average Conc. S.D.	Low Conc. Mean	Low Conc. S.D.	No ST Mean	No ST S.D.	Chi-Square	P-Value
Assam	Additional Classroom	2.16	1.56	2.30	0.82	2.55	0.88	2.48	1.64	1.27	0.74
	Furniture and Equipments	3.94	1.58	4.80	1.62	4.00	0.86	3.95	1.88	1.82	0.61
Kerala	Additional Classroom	N.A.	N.A.	1.75	1.26	0.50	0.70	2.86	2.64	9.38	0.01**
	Furniture and Equipments	N.A.	N.A.	2.00	1.15	4.50	1.78	3.59	1.71	6.30	0.04*
Madhya Pradesh	Additional Classroom	2.18	1.77	2.10	1.96	2.21	1.49	2.57	1.87	7.61	0.05*
	Furniture and Equipments	4.58	2.07	5.14	1.83	4.97	2.20	4.80	2.29	2.45	0.48
Maharashtra	Additional Classroom	2.25	1.50	1.33	0.57	2.45	1.21	1.83	1.36	3.61	0.30
	Furniture and Equipments	4.25	1.71	5.00	1.00	3.63	1.91	5.24	1.77	8.66	0.03*
Orissa	Additional Classroom	2.45	1.55	2.80	1.47	2.66	1.49	2.38	1.66	3.56	0.31
	Furniture and Equipments	5.86	2.09	4.80	2.04	5.84	1.85	6.20	1.73	8.97	0.03*
Tamil Nadu	Additional Classroom	2.66	1.03	3.00	0.00	0.00	0.00	2.09	1.42	4.57	0.20
	Furniture and Equipments	4.00	2.83	4.50	3.53	8.00	0.00	6.26	2.18	6.27	0.09

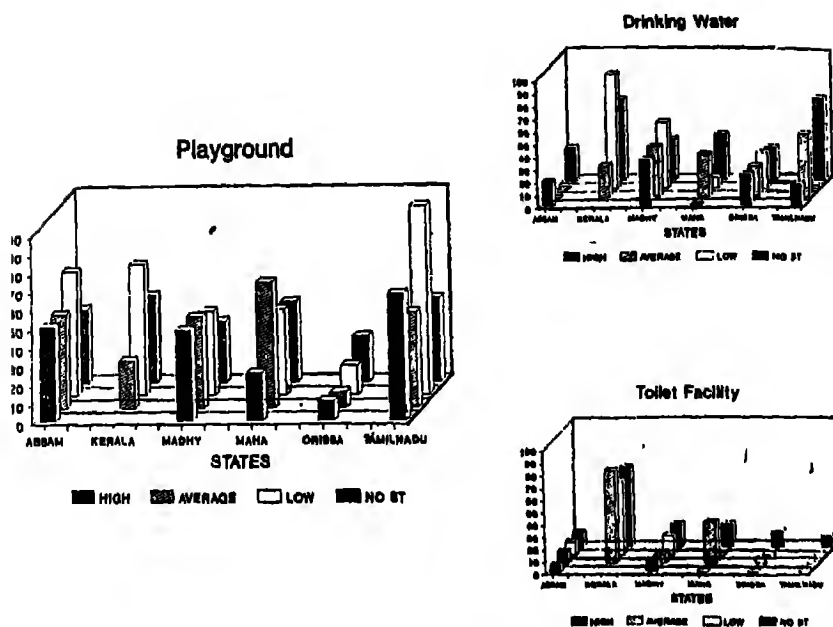


FIG. 5 Playground, drinking water and toilet facilities available

Kerala. Especially in Madhya Pradesh schools with average and high concentration of ST students had significantly less toilet facilities than schools under no ST and low concentration group (Fig.5). In almost all the states special attention is required for providing drinking water and toilet facilities to school with and without ST students. Regarding playground facilities special attention is required in Madhya Pradesh and Orissa.

1

#### OB SCHEME AND INSTRUCTIONAL AIDS

Table 7 indicates results regarding the coverage of schools by OB scheme and availability of instructional aids. The availability of 12 instructional aids: maps, globes, charts, toys, games kit, science kit, mini tool kit, reference book, children books, magazines and musical instruments were aggregated with the score of one for each set of the item. In Orissa, percentage of schools having 50-74 per cent of ST students (average group) covered by OB scheme was significantly lower than schools under no ST group. In Tamil Nadu school covered under OB scheme was significantly lower in high concentration group. Six schools were clustered in this group and only 17 per cent of those schools were covered under OB

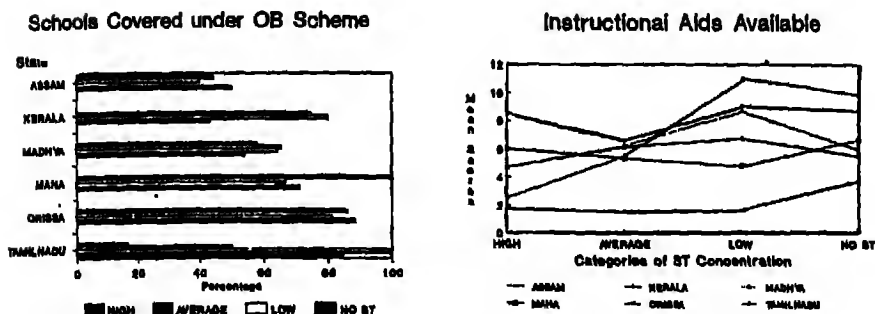


FIG. 6 OB scheme and instructional aids

schemes. It requires further intervention. In Assam, Madhya Pradesh and Tamil Nadu, schools with high concentration of ST students had significantly (Assam  $Z=2.85$ ,  $p < .01$ , Madhya Pradesh  $Z=3.14$ ,  $P < .01$ ) less instructional aids than schools under no ST group. The percentage of schools covered under OB scheme and availability of instructional aids are presented in Fig. 6. Most of these instructional aids were supplied under OB scheme. When schools were covered under OB scheme but having less instructional aids implies that either those materials were not reached to the school or not used by the teacher. Necessary supervision and teacher training programme should be arranged for the effective implementation of OB scheme especially in the DPEP states of Assam, Madhya Pradesh and Tamil Nadu.

#### PRESCHOOL AND INCENTIVES

Table 8 represents the preschool facilities and pupil incentive schemes available to the schools with different concentration of ST students. Only in Madhya Pradesh schools with high concentration of ST students had 10 per cent less preschool facilities than schools with low concentration of ST students. However in general the availability of preschool facility was very low in all the states under study. The intervention research supported the significant contribution of preschool experience on quality and quantity of learning. Disadvantaged children were more benefited (Murlidharan and Banerjee, 1974). Therefore, specific provision should be made in general to provide preschool facilities to the ST students at an early age. Percentage of the schools with high concentration of ST students in Tamil Nadu had significantly less pupil incentives than other three categories. In Orissa the availability of pupil incentive schemes varies from 78 per cent to 83 per cent in four categories despite such a provision in state policy

# INPUTS IN PRIMARY SCHOOLS WITH DIFFERENT LEVELS OF CONCENTRATION

Table 6

## Playground, Drinking Water and Toilet

State	School Facility	Percentage of Schools having the Facility					P-Value
		High Conc.	Average Conc.	Low Conc.	No ST	Chi-Square	
Assam	Playground	50.00	50.00	66.7	39.4	3.43	0.33
	Safe Drinking Water	19.40	00	00	26.0	6.54	0.09
	Toilet	5.6	10.0	11.1	11.5	1.07	0.78
Kerala	Playground	N.A.	25.0	70.0	46.5	2.88	0.24
	Safe Drinking Water	N.A.	25.0	90.0	63.6	5.60	0.06
	Toilet	N.A.	75.0	60.0	64.6	0.28	0.87
Madhya Pradesh	Playground	47.8	48.3	44.4	32.4	13.66	0.01**
	Safe Drinking Water	36.2	39.7	52.2	32.2	13.98	0.01**
	Toilet	8.7	6.9	15.6	18.2	8.24	0.04*
Maharashtra	Playground	25.0	66.7	45.5	42.6	1.25	0.72
	Safe Drinking Water	00	33.3	9.1	36.1	5.31	0.15
	Toilet	00	33.3	00	18.5	3.86	0.27
Orissa	Playground	10.3	8.0	15.6	24.4	5.16	0.16
	Safe Drinking Water	24.1	24.0	28.1	25.6	0.17	0.98
	Toilet	00	4.0	3.1	12.8	7.01	0.07
Tamil Nadu	Playground	66.7	50.0	100	44.2	2.35	0.50
	Safe Drinking Water	16.7	50.0	00	64.4	7.14	0.08
	Toilet	00	00	00	8.7	0.85	0.84

needs further investigation. In other states schools in all the four categories had one or other form of incentive schemes without any exception.

## TEACHER QUALITY

Five input measures of teacher quality were studied. Teachers' academic qualifications was treated as overall measure with aggregations of qualifications ranging from 10 years of schooling to 16 years of education. Each level was given a score of 1. The maximum score for a teacher was 5. The second measure was teachers with below 10 years of schooling. In Assam the mean teacher qualification score was significantly higher for school under no ST group ( $Z=-3.58$   $p<.001$ ) than the schools with high concentration of ST students. The same trend

# INPUTS IN PRIMARY SCHOOLS WITH DIFFERENT LEVELS OF CONCENTRATION

TABLE 7  
OB Scheme and Instructional Aids

State	School Facility	Mean Standard Deviation or Percentage of Schools Having the Facilities										Chi-Square	P-Value
		High conc. Mean	S.D.	Average conc. Mean	S.D.	Low Conc. Mean	S.D.	No ST Mean	S.D.				
Assam	OB Scheme	44.4	--	40.0	--	11.1	--	50.0	--	5.26	0.15		
	Instructional Aids	1.80	2.29	1.60	1.43	1.67	2.50	3.69	3.47	11.51	0.01**		
Kerala	OB Scheme	N.A.	N.A.	75.0	--	80.0	--	43.4	--	6.10	0.05*		
	Instructional Aids	N.A.	N.A.	6.25	4.50	8.70	2.67	5.98	3.47	5.45	0.06		
Madhya Pradesh	OB Scheme	58.0	--	65.5	--	64.4	--	54.1	--	5.52	0.14		
	Instructional Aids	4.68	3.92	6.12	4.28	6.73	4.17	5.48	4.22	11.93	0.01**		
Maharashtra	OB Scheme	100	--	66.7	--	63.6	--	71.3	--	1.96	0.58		
	Instructional Aids	6.00	2.16	5.33	5.13	4.82	3.25	6.68	3.20	4.29	0.23		
Orissa	OB Scheme	86.2	--	60.0	--	81.3	--	88.5	--	10.90	0.01**		
	Instructional Aids	8.55	3.78	6.60	4.17	9.09	2.83	8.74	2.91	5.88	0.11		
Tamil Nadu	OB Scheme	16.7	--	50.0	--	100	--	84.6	--	18.14	0.01**		
	Instructional Aids	2.50	4.23	5.50	7.78	11.0	00	9.88	2.90	10.75	0.01**		

was found in the state of Orissa ( $Z=-2.05$ ,  $p<.04$ ). It implies that in these states schools with high concentration of ST students required more qualified teachers for imparting quality education. It is surprising to note that in case of Assam the schools with high concentration of ST students had not only more number of less qualified teachers but also more number of underqualified teachers (teachers below Class X). This finding needs special attention (Fig. 7). In Orissa the same pattern of result was observed though it was not statistically significant. In Madhya Pradesh underqualified teachers were less in high concentration category whereas it was more in low concentration category. Except Kerala all the states under the study were more or less burdened with underqualified teachers which focuses the need of educational training programmes for the teachers to provide opportunity for their educational and professional development.

In Table 10, the percentage of trained teachers, the duration of inservice training and the number of years in teaching experience in different categories of schools were analyzed. In Tamil Nadu and Madhya Pradesh, schools in high

# INPUTS IN PRIMARY SCHOOLS WITH DIFFERENT LEVELS OF CONCENTRATION

TABLE 8  
Preschool Facility and Pupil Incentives

State	School Facility	Percentage of Schools having the Facility				Chi-Square	P-Value
		High Conc	Average Conc.	Low Conc.	No ST		
Assam	Preschool Facility	8.3	10.0	22.2	17.3	2.24	0.52
	Pupil Incentives	94.4	80.0	88.9	83.7	2.99	0.39
Kerala	Preschool Facility	N.A	00	10.0	1.0	4.30	0.12
	Pupil Incentives	N.A	100	100	100	--	--
Madhya Pradesh	Preschool Facility	10.1	10.3	20.0	9.9	7.99	0.05*
	Pupil Incentives	91.3	91.4	95.6	94.3	2.04	0.56
Maharashtra	Preschool Facility	25	33.3	18.2	41.7	2.69	0.44
	Pupil Incentives	100	100	90.9	81.5	2.12	0.54
Orissa	Preschool Facility	13.8	4.0	12.5	9.0	1.80	0.61
	Pupil Incentives	82.8	80.0	81.3	78.2	0.32	0.95
Tamil Nadu	Preschool Facility	00	00	00	10.6	1.05	0.79
	Pupil Incentives	83.3	100	100	99.0	8.10	0.04*

concentration category had significantly higher percentage ( $Z=-3.11$ ,  $p<.002$  and  $Z=-3.73$ ,  $p<.001$  respectively) of trained teachers than schools under no ST group. The same trend of result was observed in Assam also. The situation was however different in case of inservice training in Madhya Pradesh and Maharashtra where the schools under no ST group had higher mean number of days of inservice training. While reverse was in the case of Kerala. In Assam the schools with low concentration and no ST students had significantly more experienced teachers in terms of years of training than in other categories. The same pattern of result was also found in Madhya Pradesh. From this result a general observation can be made that the duration of inservice training was quite low in almost all the states,



# INPUTS IN PRIMARY SCHOOLS WITH DIFFERENT LEVELS OF CONCENTRATION

TABLE 9  
Qualification of Teachers

State	Items	Qualification of Teachers									
		High conc.		Average conc		Low conc.		No ST		Chi-	P-
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Square	Value
Assam	Qualification	1.73	0.64	1.53	0.55	1.75	0.53	2.13	0.55	19.67	.001**
	Below	45.00	40.12	56.00	43.32	41.11	39.83	18.01	27.57	21.10	.001**
	Class X										
Kerala	Qualification	N.A.	N.A.	3.26	0.38	2.80	0.51	2.70	0.38	6.71	.03*
	Below	N.A.	N.A.	.00	.00	.00	.00	0.20	2.01	0.14	0.93
	Class X										
Madhya Pradesh	Qualification	3.20	0.80	3.15	0.99	3.23	0.88	3.29	0.76	3.27	0.35
	Below	5.79	18.26	6.61	23.35	10.59	21.96	6.20	17.26	7.59	0.05*
	Class X										
Maharashtra	Qualification	2.37	0.75	2.67	1.15	2.22	0.38	2.57	0.63	4.03	0.26
	Below	.00	.00	.00	.00	.00	.00	4.03	11.96	2.38	0.49
	Class X										
Orissa	Qualification	2.49	0.86	2.96	0.62	2.94	0.62	2.89	0.65	6.14	0.10
	Below	23.56	34.65	6.00	14.34	8.54	18.77	9.97	16.19	5.87	0.12
	Class X										
Tamil Nadu	Qualifications	2.98	0.36	3.06	.00	.00	.00	2.81	0.49	0.47	0.79
	Below	8.63	6.62	6.67	.00	.00	.00	3.27	9.24	8.07	0.02*
	Class X										

specially in Madhya Pradesh where high percentage of trained teachers were existing in schools of high concentration category but having less teaching experience and inservice training (Fig. 8). This situation call for (a) improved opportunity for inservice education and training for teachers in tribal area, (b) formulation of rational teachers requirement and placement policy, and (c) incentive scheme for qualified and trained teachers to work in schools with high concentration of tribal students.

## MULTIGRADE TEACHING, TEACHER-PUPIL RATIO AND TEACHER ATTENDANCE

Table 11 gives the results regarding multigrade teaching, teacher-pupil ratio and teacher attendance. In Assam, Madhya Pradesh, Maharashtra and Orissa the percentage of teachers reporting multigrade teaching was significantly higher in high concentration category than in other three groups. In Maharashtra, though overall group comparison was not significant but paired group mean comparison

# INPUTS IN PRIMARY SCHOOLS WITH DIFFERENT LEVELS OF CONCENTRATION

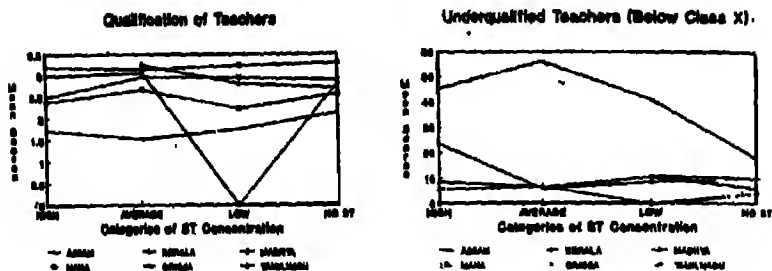


Fig. 7 Teacher quality

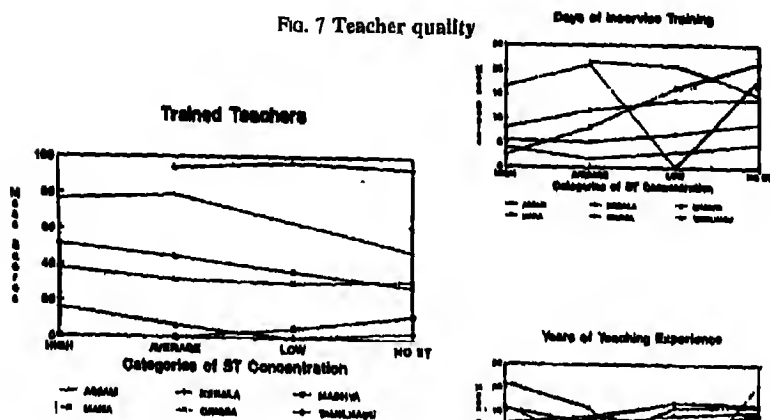


Fig. 8 Teacher training

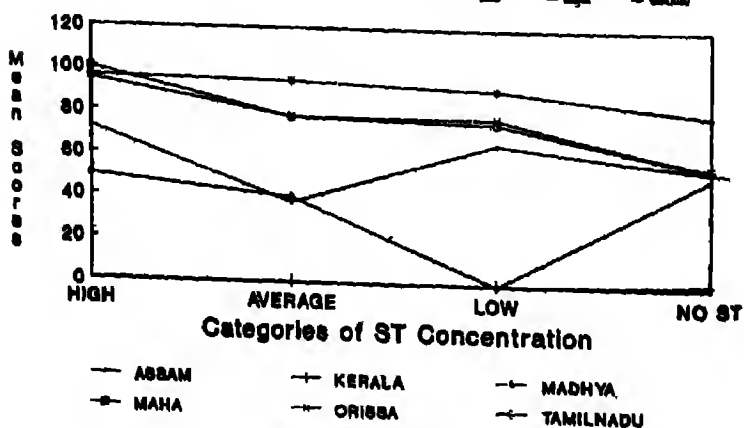


Fig. 9 Multigrade teaching

# INPUTS IN PRIMARY SCHOOLS WITH DIFFERENT LEVELS OF CONCENTRATION

TABLE 10  
Teacher Training

State	Items	Initial and Inservice Training of Teachers										Chi-Square	P-Value
		High conc.		Average conc.		Low conc.		No ST					
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.				
Assam	Trained	76.67	33.29	79.0	33.48	63.70	24.84	47.95	30.99	24.71	.001**		
	Inservice	4.06	4.79	1.75	2.68	3.10	4.05	4.84	6.43	4.38	0.22		
	Teaching	12.62	7.82	14.11	6.89	16.94	9.24	16.12	7.11	6.66	0.08		
	Experience												
Kerala	Trained	N.A.	N.A.	93.75	12.50	96.67	10.54	93.72	13.05	0.69	0.71		
	Inservice	N.A.	N.A.	21.56	14.38	20.70	5.43	14.70	9.51	5.96	0.05*		
	Teaching	N.A.	N.A.	13.98	4.85	12.21	5.26	14.14	4.89	1.88	0.39		
	Experience												
Madhya Pradesh	Trained	51.21	45.58	44.54	44.74	36.31	38.21	28.87	34.38	18.69	.001**		
	Inservice	8.07	10.47	11.51	14.21	13.57	17.43	13.74	14.72	12.90	.01**		
	Teaching	11.36	8.54	13.30	7.71	17.03	9.18	16.77	8.32	34.27	.001**		
	Experience												
Maharashtra	Trained	.00	.00	.00	.00	5.30	11.94	12.81	22.57	3.83	0.28		
	Inservice	2.50	5.00	8.11	7.57	16.15	12.70	21.45	17.98	8.57	0.04*		
	Teaching	16.12	13.02	8.33	9.45	15.93	7.72	16.04	8.53	2.03	0.57		
	Experience												
Orissa	Trained	37.93	41.99	31.80	30.69	30.10	26.96	31.96	32.03	0.12	0.98		
	Inservice	5.54	5.38	5.20	6.11	6.82	5.05	9.23	9.73	8.67	0.03*		
	Teaching	15.65	8.69	12.46	6.45	14.25	6.41	14.86	5.58	2.39	0.49		
	Experience												
Tamil Nadu	Trained	16.10	16.73	6.67	.00	.00	.00	3.73	9.48	10.54	.01**		
	Inservice	16.47	1.93	21.07	.00	.00	.00	18.75	7.06	1.49	0.47		
	Teaching	20.89	5.41	15.93	.00	.00	.00	20.54	4.77	1.27	0.53		
	Experience												

indicated significant difference ( $Z = -1.98, P < .05$ ). The trend indicated less number of teachers involved in multigrade teaching as one goes down to average and low concentration schools (Fig. 9). The difference in teacher-pupil ratio was not significant in any of the states except in Madhya Pradesh where the schools with no ST students had higher teacher-pupil ratio. Teacher attendance as reported by pupils provided a mixed situation. It was higher in schools with no ST and with low ST student concentration but was not statistically significant. Greater attention is required for equipping teachers with multigrade teaching skills.

By and large the difference in time use was not significant in most of the

# INPUTS IN PRIMARY SCHOOLS WITH DIFFERENT LEVELS OF CONCENTRATION

TABLE II  
Multigrade Teaching, Teacher Attendance and Teacher-pupil Ratio

Teacher-pupil Ratio													
State	Items	Mean, SD and Significance Level										Chi-Square	P-Value
		High conc.		Average conc.		Low conc.		No ST					
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.				
Assam	Multigrade Teaching	75.32	40.08	37.50	46.02	66.11	45.67	53.85	43.70	8.94	0.03*		
	Teacher Attendance	56.58	44.67	92.38	44.87	76.35	38.38	59.85	40.91	3.35	0.33		
	Teacher-pupil Ratio	35.09	14.87	34.49	14.17	31.98	11.85	40.43	22.69	1.49	0.68		
Kerala	Multigrade Teaching	N.A.	N.A.	00	00	00	00	1.66	10.67	0.58	0.74		
	Teacher Attendance	N.A.	N.A.	51.33	35.66	35.97	36.46	50.20	30.13	1.84	0.39		
	Teacher-pupil Ratio	N.A.	N.A.	31.67	5.93	32.43	5.90	30.17	10.45	0.18	0.91		
Madhya Pradesh	Multigrade Teaching	95.89	16.02	94.54	20.08	91.26	20.31	79.86	34.47	31.62	0.01**		
	Teacher Attendance	62.61	93.09	54.31	42.00	60.91	42.11	60.57	41.81	1.53	0.67		
	Teacher-pupil Ratio	38.24	21.76	46.12	21.11	46.29	20.14	49.37	23.81	21.91	0.01**		
Maharashtra	Multigrade Teaching	100	00	77.77	38.49	75.76	42.40	55.74	43.82	6.49	0.09		
	Teacher Attendance	72.22	48.43	100	00	93.18	9.84	80.86	33.56	2.63	0.45		
	Teacher-pupil Ratio	38.25	13.88	38.73	13.54	35.54	12.99	44.11	19.35	2.95	0.39		
Orissa	Multigrade Teaching	94.83	13.44	78.00	28.64	77.97	29.42	54.17	40.69	29.53	0.01**		
	Teacher Attendance	55.95	44.19	68.23	34.02	81.92	26.41	74.50	32.21	5.25	0.15		
	Teacher-pupil Ratio	25.24	13.37	26.61	9.50	31.93	16.49	27.02	12.90	4.40	0.22		
Tamil Nadu	Multigrade Teaching	49.62	19.34	40.00	00	00	00	51.17	33.55	0.16	0.92		
	Teacher Attendance	92.02	7.19	00	00	00	00	94.18	8.36	0.62	0.43		
	Teacher-pupil Ratio	59.25	19.36	56.25	8.84	40.50	00	57.92	31.67	0.76	0.86		

# INPUTS IN PRIMARY SCHOOLS WITH DIFFERENT LEVELS OF CONCENTRATION

TABLE 12  
Instructional Time

State	Items	Mean, SD and Significance Level									
		High conc.		Average conc.		Low conc.		No ST		Chi-Square	P-Value
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.		
Assam	Total Hours Devoted to Teaching	940.4	145.9	899.2	110.6	945.6	194.9	923.7	148.6	0.97	0.81
	Time for Discussion with Pupil	23.62	12.34	25.34	12.24	26.52	11.31	27.61	12.69	1.85	0.60
	Time for Group Learning	10.07	6.07	9.89	5.22	8.44	6.83	9.07	6.50	1.18	0.75
	Time for Practice	16.36	7.99	19.44	11.46	12.88	5.93	15.03	5.59	3.42	0.33
	Time for Home work	15.43	9.17	14.89	5.75	14.43	4.43	14.49	4.98	0.49	0.91
Kerala	Total Hours Devoted to Teaching	N.A.	N.A.	920.5	59.88	96.93	53.56	897.2	49.6	4.39	0.11
	Time for Discussion with Pupil	N.A.	N.A.	36.62	2.67	34.43	8.16	38.50	9.98	2.27	0.32
	Time for Group Learning	N.A.	N.A.	12.31	4.31	13.42	2.96	10.60	4.34	7.43	0.02*
	Time for Practice	N.A.	N.A.	13.98	1.49	15.97	3.95	13.03	4.46	4.19	0.12
	Time for Home work	N.A.	N.A.	11.43	2.21	9.88	3.02	9.84	3.50	1.44	0.48
Madhya Pradesh	Total Hours Devoted to Teaching	1279.8	150.9	1286.7	145.6	1258.1	196.1	1193.1	190.4	34.13	0.01**
	Time for Discussion with Pupil	27.99	18.86	28.00	14.96	27.91	14.66	28.07	16.18	0.61	0.89
	Time for Group Learning	11.84	7.34	11.99	6.75	11.02	5.87	12.17	7.50	1.31	0.71
	Time for Practice	13.76	8.69	14.29	6.52	13.94	6.36	13.80	6.77	1.53	0.67
	Time for Home work	12.14	7.85	10.24	6.58	11.33	6.16	11.36	5.94	2.54	0.47

# INPUTS IN PRIMARY SCHOOLS WITH DIFFERENT LEVELS OF CONCENTRATION

Maharashtra	Total Hours Devoted to Teaching	1506.0	283.0	1333.8	65.02	1275.4	286.6	1212.5	286.4	4.66	0.20
	Time for Discussion with Pupil	31.48	8.10	34.92	14.77	35.54	15.08	28.36	13.78	3.18	0.36
	Time for Group Learning	11.75	3.70	13.05	5.22	8.71	8.15	10.65	7.10	1.23	0.74
	Time for Practice	13.20	2.44	15.87	1.69	14.09	4.01	14.91	5.66	0.84	0.84
	Time for Home work	9.06	4.60	13.49	9.33	13.21	6.53	13.99	7.52	2.17	0.54
Orissa	Total Hours Devoted to Teaching	1030.2	177.7	1040.6	223.9	1135.0	139.1	1077.4	163.8	5.19	0.16
	Time for Discussion with Pupil	47.20	19.10	51.06	17.99	50.25	14.96	49.15	15.17	1.66	0.65
	Time for Group Learning	4.48	4.85	5.36	5.35	5.67	5.43	5.02	4.03	1.39	0.71
	Time for Practice	12.54	7.60	9.54	6.70	8.82	5.18	10.55	4.74	7.23	0.06
	Time for Home work	9.47	4.08	9.44	6.91	7.55	4.57	9.18	4.13	4.42	0.22
Tamil Nadu	Total Hours Devoted to Teaching	1097.1	42.1	1009.3	00	00	00	1076.7	47.7	1.96	0.37
	Time for Discussion with Pupil	33.98	2.39	27.28	00	00	00	37.48	10.55	3.01	0.22
	Time for Group Learning	10.04	1.94	9.18	00	00	00	10.45	4.73	0.41	0.81
	Time for Practice	14.74	2.20	16.47	00	00	00	13.60	4.10	2.54	0.28
	Time for Home work	12.31	3.02	17.45	00	00	00	11.69	3.35	2.67	0.26

states (Table 12). Only in Madhya Pradesh total hours devoted for teaching-learning purpose was significantly higher in the schools of high concentration categories than low ( $Z=-3.76$ ,  $P<0.01$ .)

## USE OF TEXTBOOKS

The difference in the various uses of textbooks was not significant in any of the

# INPUTS IN PRIMARY SCHOOLS WITH DIFFERENT LEVELS OF CONCENTRATION

TABLE 13

## Use of Textbooks

State	Items	Mean, SD and Significance Level									
		High conc.		Average Conc.		Low Conc.		No ST		Chi-Square	P-Value
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.		
Assam	Teacher Reads	98.61	8.33	100	00	100	00	97.93	7.81	2.41	0.49
	Textbook										
	Child Reads	92.50	24.42	95.50	9.56	92.22	17.16	95.32	13.05	0.78	0.85
	Aloud										
	Child Self Reads	82.08	36.63	98.00	6.32	95.55	13.33	84.88	30.22	2.59	0.46
Kerala	Textbook	96.67	16.90	95.50	9.56	100	00	97.83	7.56	2.95	0.39
	Homework										
	Teachers Reads	N.A.	N.A.	83.75	11.09	72.33	23.66	79.89	19.54	1.37	0.50
	Textbook										
	Child Reads	N.A.	N.A.	93.75	12.50	76.83	24.72	83.29	18.71	1.68	0.43
Madhya Pradesh	Aloud										
	Child Self Reads	N.A.	N.A.	100	00	76.83	24.73	84.93	17.70	4.37	0.11
	Textbook	N.A.	N.A.	90.00	11.55	84.67	13.58	91.75	13.24	4.57	0.10
	Homework										
	Teacher Reads	97.34	13.89	98.70	7.29	98.20	7.83	95.86	15.64	3.92	0.27
Maharashtra	Textbook										
	Child Reads	97.10	14.56	90.52	27.24	95.24	15.93	95.69	15.55	2.72	0.44
	Aloud										
	Child Self Reads	92.51	22.96	94.83	22.34	95.76	15.11	94.43	17.48	2.45	0.48
	Textbook	99.27	6.02	96.55	18.41	98.29	8.38	97.56	11.90	2.64	0.45
Orissa	Homework										
	Teacher Reads	100	00	100	00	100	00	98.19	8.41	1.04	0.79
	Textbook										
	Child Reads	100	00	100	00	100	00	88.28	23.02	6.09	0.10
	Aloud										
Orissa	Child Self Reads	100	00	100	00	97.73	7.54	92.09	20.34	1.83	0.61
	Textbook	100	00	88.89	19.24	93.18	16.17	95.69	14.39	2.37	0.49
	Homework										
	Teacher Reads	100	00	100	00	98.95	5.89	98.71	4.93	3.67	0.29
	Textbook										
Orissa	Child Reads	96.55	13.64	94.80	13.27	87.03	30.77	93.38	15.73	2.87	0.41
	Aloud										
	Child Self Reads	97.13	10.97	96.40	11.13	92.97	20.31	93.78	18.66	1.44	0.69
	Textbook	98.27	9.28	96.00	20.00	98.96	5.89	97.63	9.11	1.29	0.73
	Homework										

## INPUTS IN PRIMARY SCHOOLS WITH DIFFERENT LEVELS OF CONCENTRATION

Tamil Nadu	Teacher Reads	100	00	100	00	00	00	100	00	00	—
	Textbook										
	Child Reads	97.97	2.78	100	00	00	00	98.50	4.54	2.38	0.30
	Aloud										
	Child Self	90.32	6.94	100	00	00	00	95.73	9.11	5.38	0.07
	Reads										
	Textbook	100	00	93.33	00	00	00	100	00	42.00	0.01**
	Homework										

states except in Tamil Nadu where it was used for assigning homework (Table 13). Though it was statistically significant but generalization should be made cautiously due to small sample, specifically in average and low concentration categories.

### HOME WORK

The percentage of teachers who assign home work frequently are described in Table 14. In Assam the percentage was less in schools with average and high concentration of ST students. Similarly in Madhya Pradesh, less number of teachers gave home work frequently to students of average concentration category. In other states the difference was not significant.

### SCHOOL HEALTH

The difference among different categories of schools were not significant except in respect of immunization and health check up in Orissa where the percentage of schools was significantly higher in the category of no ST and low concentration of ST students in comparison to high concentration category.

### Implication for DPEP Intervention

The present study was based on the data collected in Baseline Assessment Study. A segment of disadvantaged students, scheduled tribe, was in focus. Accessibility of school inputs to primary schools with different level of concentration of ST students were explored. The generalization of emerging findings are restricted only to the corresponding districts covered under the study from different states. The generalization also may have serious problem due to differences in ST habitats from state to state. Taking into account the individual need of each district on the basis of tribal concentration necessary intervention can be planned. The implication issues are discussed according to the school inputs covered in the study



# INPUTS IN PRIMARY SCHOOLS WITH DIFFERENT LEVELS OF CONCENTRATION

TABLE 14  
Homework

State	Items	Mean and Standard Deviation								Chi-Square	P-Value
		High conc.		Average conc.		Low conc.		No ST			
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D		
Assam	Homework Given	47.45	40.27	34.00	35.42	79.26	27.32	66.04	36.54	13.03	0.01**
Kerala	Homework Given	N.A.	N.A.	80.00	16.33	80.50	29.39	71.03	24.56	2.59	0.27
Madhya Pradesh	Homework Given	75.84	37.87	67.84	43.49	74.20	37.17	84.44	29.27	11.70	0.01**
Maharashtra	Homework Given	87.5	25.00	100.00	86.36	32.33	82.72	26.01	2.82	0.42	
Orissa	Homework Given	60.57	35.59	66.13	38.36	68.69	31.97	68.63	32.04	0.93	0.82
Tamil Nadu	Homework Given	94.16	6.04	93.33	00.00	00.00	95.70	9.60	2.16	0.34	

## A PHYSICAL FACILITIES AND SERVICES

In almost all the states schools with high, average and low concentration of ST students are functioning in their own permanent building. In contrast the less proportion of buildings have pucca structure though not statistically significant. In Madhya Pradesh schools of high and average concentration categories are lacking pucca building facilities. As evident in baseline study result of this state the rooms are in dilapidated conditions. The same situation may be prevailing in the schools of high and average concentration category. Necessary provision should be made in district plan of Madhya Pradesh to improve the building condition of schools under these category.

Schools of high concentration category in Maharashtra and Tamil Nadu and average concentration in Orissa have less furniture and equipments. Either the furniture and equipments are broken and not repaired or may not be used. The facts should be ascertained with proper supervision by the district authority and necessary action may be initiated in this regard.

Provision of drinking water and toilet facilities are not substantial in almost all the states except Kerala. It is significantly less in Madhya Pradesh. These basic facilities should be provided in the schools with high average and low concentration of ST students.

# INPUTS IN PRIMARY SCHOOLS WITH DIFFERENT LEVELS OF CONCENTRATION

TABLE 15  
School Health

State	Health Facility	Percentage of Schools Having the Facility				Chi-Square	P-Value
		High conc.	Average conc.	Low conc.	No ST		
Assam	First Aid Kits	00	00	00	1.9	1.07	0.78
	Health	22.2	30.0	11.1	12.5	3.64	0.30
	Checkup Immunization	13.9	30.0	11.1	14.4	1.92	0.59
Kerala	First Aid Kits	N.A	25	40	25.3	1.02	0.60
	Health	N.A	25	10.0	34.3	2.57	0.27
	Checkup Immunization	N.A	50.0	10.0	27.3	2.56	0.28
Madhya Pradesh	First Aid Kits	5.8	3.4	12.2	11.4	5.50	0.14
	Health	68.1	77.6	81.1	71.3	5.18	0.16
	Checkup Immunization	31.9	43.1	50.0	47.3	6.70	0.08
Maharashtra	First Aid Kits	00	00	00	21.3	4.69	0.19
	Health	50	66.7	63.6	70.4	0.93	0.82
	Checkup Immunization	50	33.3	54.5	65.7	2.11	0.55
Orissa	First Aid Kits	6.9	4.0	9.4	6.4	0.67	0.88
	Health	34.5	12.0	37.5	44.9	8.89	0.03*
	Checkup Immunization	41.4	40.0	56.3	69.2	10.62	0.01**
Tamil Nadu	First Aid Kits	16.7	50.0	00	24.0	1.24	0.74
	Health	83.3	100	00	95.2	16.75	.001**
	Checkup Immunization	50.0	100	00	66.3	3.62	0.30

## B. OB SCHEME AND INSTRUCTIONAL AIDS

The coverage of OB scheme is significantly low in high and average concentration category of Orissa and Tamil Nadu respectively. The scheme may be extended to schools of these states. In Madhya Pradesh and Assam schools of high concentration category are lacking instructional aids in spite of average number of schools covered under OB scheme. Further probing is required in this regard. Teacher of these schools should be trained to use the materials provided under OB scheme.

### C. PRESCHOOL FACILITY AND PUPIL INCENTIVE

Preschool experience prepares the child to meet the curriculum demand at primary stage. Eventually it checks the dropout rate. In the same manner the pupil incentive scheme motivate the children to stay at school on one hand and on the other inspire parents to send their children to school. The results reveals that preschool facility is not enough in the school of all categories. The extension of ICDS schemes to these areas or developing a model of readiness by using the low cost aids and locally available materials will solve the purpose. In all the states more than 80 per cent of schools are being covered by various incentive schemes. Further in-depth study could be taken to prove its effectiveness for tribal children.

### D. TEACHER QUALITY

Schools of high and average concentration of ST students in the state of Assam and Madhya Pradesh are lacking trained teachers and inservice training facilities. The teachers working in these schools of Orissa and Maharashtra are also deprived of inservice training opportunity. An imperative need for inservice training is raised for the improvement of teaching and learning process in these schools. Formulation of rational teacher recruitment and placement policy is required to equip these schools with trained and qualified teachers. Further to motivate and retain these teachers working in schools with high concentration of tribal students, incentive in any form may be provided.

### E. MULTIGRADE TEACHING

Higher percentage of teachers in high concentration category involved in multigrade teaching specifically in Assam, Madhya Pradesh, Maharashtra and Orissa. If this teaching strategy is not managed properly the performance of children may deteriorate. Strategic guidelines are required to facilitate the "peer to peer" approach in multigrade teaching situation. School or area based teacher training programme should be organized for these teachers to enhance their teaching competence in multigrade teaching.

In case of teaching patterns, as an input to learning process, no significant difference is obtained among different categories of tribal student concentration. It seems the quality of teaching adopted in these schools are similar to other schools.

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# Teacher Policy, Training Needs and Perceived Status of Teachers

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## ABSTRACT

*The study focuses the State Government teacher policy covering teacher recruitment procedure, demand and supply of teachers, initial posting, transfer policy and representation of female teachers in the work force. It also examines the existing position of trained and untrained teachers of all the seven states. Teachers' perception about pre-service and in-service training was studied. Attempts are also made to identify needs of elementary teachers and their perceived social, economic and professional status were ascertained. Besides this, different problems related to residential accommodation particularly for female teachers, separate toilet facilities for female teachers, multi-grade teaching, high rate of students absentism, non-availability of textbooks in time and parents apathy towards children's education are also highlighted in this paper.*

*This study has suggested various interventions for improving the quality of elementary teacher education.*

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## Introduction

Quality Primary Education is a significant input to achieve the goal of "Education For All by 2000 AD". But it is depressing to note that the quality

of primary education is low (Shukla *et al.*, 1993). Studies conducted by Jangira and Yadav (1994) in DPEP districts reveal that learning achievement of pupils in Reading and Mathematics is abysmally low. The situation is a cause for deep concern and raises a number of issues : Are teachers qualified to teach? Are they appropriately trained to teach? Is teacher policy of different State governments conducive to promote and sustain teachers' motivation for good performance. Are there work and career rewards for promoting their performance? How do teachers' perceive their social, economic and professional status? The study was conducted to find answers to these questions.

### **Objectives**

Specific objectives of the study were to :

- Document and analyse state policy on teacher training, their recruitment procedure, transfer policy, demand and supply, initial and in-service training, etc.
- Document and analyse infrastructural facilities available at the district level for initial and in-service training.
- Study perceptions of teachers about their social economic and professional status.
- Identify training needs of teachers.

### **Methodology**

To realise objective relating to state policy with regard to teachers, documents and office orders were studied. The faculty of SCERTs/DIETs were interviewed. Data with regard to teachers' training and their perceptions about their status was collected through interview schedule.

### **Sample**

Two districts in each of the states of Assam, Maharashtra, Karnataka, Kerala, Tamil Nadu, Orissa and five districts of Madhya Pradesh were selected. The selection of districts was purposive wherever available, tribal district was selected.

One block in each district was selected randomly at the rural level. From the list of secondary schools in the block, one secondary school was selected randomly. From the urban area, one secondary school at the district headquarters was selected randomly. Primary school teachers working in the catchment area of the selected secondary schools both in the block and district headquarters constituted the sample. The number of teachers selected in a district was hundred. The 100 teachers were apportioned to rural and urban areas on the basis of

proportion of rural and urban population in the district according to 1991 Census. One thousand nine hundred and seven teachers constituted the sample.

### **Tools**

The following tools were developed for collecting data:

1. State policy on Teacher Training Guidelines
2. Schedule of SCERT Faculty
3. Schedule of Districts/Block Education Officer
4. Training Institute Information Schedule
5. Teacher Schedule

Investigators were provided intensive training. The training covered objectives, methodology of the study, understanding each instrument and its use to collect data. Practice in sampling and conducting interviews. The training was transacted in participatory mode with practice in simulated as well as field situation. The data was scrutinised daily in the field by the field supervisors. The final scrutiny of the data was done at the NCERT headquarters.

### **Teacher Policy**

State Governments' teacher policy covering teacher recruitment procedure, demand and supply of teachers initial posting and transfer policy, representation of male and female teachers in teacher work force, etc. is mentioned below.

#### **TEACHER RECRUITMENT**

Minimum academic qualifications for the post of a primary school teacher prescribed by the states of Haryana, Karnataka, Madhya Pradesh, Maharashtra and Tamil Nadu is 12 years of schooling and 2 years of diploma in elementary education. Kerala and Orissa require 10 years of schooling with two years of diploma in elementary education. In Assam, entry recruitment for a primary school teacher is 10 years of schooling without any initial training. Kerala, Assam and Orissa need to enhance minimum qualifications for the post of a primary school teacher from 10 years to 12 years schooling. Further the government of Assam needs to review its policy of recruiting teachers without any initial training. Initial training of two years after 12 years of schooling need to be the minimum qualification for a primary school teacher.

Recruitment procedure is centralized in some states. It is done at the district/regional level in other states. Centralization of recruitment of primary school teachers is hardly suitable as it poses number of problems. For instance, in the absence of initial posting policy, centrally selected teachers may not join schools

## TEACHER POLICY, TRAINING NEEDS AND PERCEIVED STATUS OF TEACHERS

located in rural or remote areas and try to get posted in urban areas. As a result, vacancies in rural, remote and hilly areas remain unfilled for a considerable period of time affecting pupils' learning adversely.

### DEMAND AND SUPPLY OF TEACHERS

There are no conscious efforts to link supply to demand of primary school teachers. As a result, turn over of teachers is almost double the requirement in states of Kerala, Maharashtra, Karnataka and Tamil Nadu. The demand and supply of teachers is however, balanced in the states of Haryana and Madhya Pradesh. In the absence of a perspective plan for elementary teacher education, growth of private unaided elementary teacher training institutions causes concern. In Maharashtra and Karnataka nearly half of the elementary teacher training institutions are ill-equipped in terms of human and materials resources.

### TRANSFER POLICY

In the states of Maharashtra, Haryana, Karnataka and Orissa, the policy is to transfer teachers after 3 to 6 years. In the states of Assam, Tamil Nadu, Madhya Pradesh and Kerala, teachers are transferred on request and administrative grounds. Absence of sound transfer policy affects teachers' motivation and performance.

In Maharashtra, the policy is to post teachers at least 25 kilometers away from their home town. In many villages, suitable residential accommodation for teachers particularly female teachers is not available. They stay on large villages or nearer towns and commute distance. This may be affecting their motivation and performance adversely. Therefore, the impact of this policy on teacher's performance and their pupils' achievement needs to be studied.

### ENTRY REQUIREMENTS

The minimum entry qualifications for admission into a primary/elementary teacher training institutes is +2 in the states of Haryana, Karnataka, Maharashtra, Madhya Pradesh and Tamil Nadu. It is matriculation (10th pass) in the states of Kerala and Orissa. In Assam, none of the institutes is running any initial teacher training programme.

### UNTRAINED TEACHERS

The percentage of untrained teachers in the states covered in the study is given in Table 1.



TABLE I  
Percentage of Trained and Untrained Teachers

<i>State</i>	<i>Trained</i>	<i>Untrained</i>
Assam	57.6	42.4
Haryana	99.5	0.5
Karnataka	95.3	4.7
Kerala	94.0	6.0
Madhya Pradesh	68.3	31.7
Maharashtra	95.0	5.0
Tamil Nadu	100	—

Table I manifests that the number of untrained teachers is very high in the state of Assam. This is because that the state has no system of initial teacher training. Teachers are recruited without any initial training and then after a certain period of service, they are deputed for initial training. In absolute number, there may be about 35,000 untrained teachers in the State. States of Assam and Madhya Pradesh need to avail of the Programme of Diploma in teacher training being launched by IGNOU from 1996. Further in-service education of untrained teachers has to be different from those of trained teachers. This is because "problems of trained and untrained teachers are different" (Cooke and Pang, 1991).

### ✓ Teacher's Perceptions about Quality of Initial Training

The quality of initial teacher training programme determines to a great extent the instructional performance of teachers. Teachers' perceptions about their initial training programmes were, therefore, ascertained. About 30 per cent teachers in Haryana and 40 per cent in Kerala expressed that the initial training which they received was not satisfactory. The unsatisfactory aspects of initial teacher training were practice teaching, field/practical work, etc. Teachers also expressed that quality of teaching staff in their teacher training institutions was wanting. There is a need to review the curriculum of initial teacher training. It should be improved by providing significant inputs.

#### PARTICIPATION IN IN-SERVICE PROGRAMME

Data was collected regarding percentage of teachers who got an opportunity to undergo in-service education during the last five years, i.e., from 1989-93. Table 2 provides data in this regard.

# TEACHER POLICY, TRAINING NEEDS AND PERCEIVED STATUS OF TEACHERS

TABLE 2  
Participation in In-service Training Programmes

State	District	Percentage of Teachers
Assam	Karbi Anglong	12.00
	Darang	48.00
Haryana	Jind	47.00
	Hisar	46.20
Karnataka	Raichur	84.00
	Belguam	37.00
Kerala	Wayanad	82.00
	Mallapuram	41.00
Maharashtra	Aurangabad	65.00
	Nanded	41.00
Tamil Nadu	South Arcot	58.00
	Dharmapuri	78.00
Orissa	Gajapati	37.00
	Rayagada	26.00
Madhya Pradesh	Betul	49.00
	Bilaspur	36.00
	Ratlam	47.00
	Sehore	69.00
	Tikamgarh	67.00

Table 2 manifests that the percentage of teachers who underwent in-service training ranges from 12 in Karbi Anglong district in Assam to 82 in Wayanad district of Kerala. In most of the districts less than 50 per cent teachers could get an opportunity to undergo in-service education once during the last five years. The low coverage of in-service training programmes in the districts is due to inadequate infrastructural facilities, inadequate allotment of funds and the absence of a conscious policy at the district level to cover all teachers. Additional facilities for in-service education of teachers need to be created at the sub-district level—block/school cluster. The duration of in-service training provided to teachers ranges from one to three weeks.

## DESIRED CONTENT OF TRAINING

Teachers were asked to mention the areas in which they need to be trained. The following areas were mentioned by them.

## TEACHER POLICY, TRAINING NEEDS AND PERCEIVED STATUS OF TEACHERS

- Content of School Subjects
- Methods of Teaching
- Multigrade Teaching
- Playway Techniques for Teaching
- Preparation and Use of Improvised Teaching Aids

### DURATION AND PERIODICITY OF TRAINING

Most of the teachers preferred training of one to two weeks' duration. In Aurangabad and Nanded districts of Maharashtra about one-third of teachers desired training of 3 weeks' duration. Three-week duration of training may be due to the condition for crossing the efficiency bar or getting selection grade. Most of the teachers wanted in-service training once in a year.

Veenman *et al.* (1994) concluded that it is not the duration but the degree of satisfaction with the in-service contributes to the impact of training at the classroom level. Further one-shot workshops are widespread but are ineffective (Fullan, 1982). It is therefore, suggested that one-shot training of two to three weeks needs to be replaced by recurrent training.

### ✓ FACTORS IMPROVING TEACHERS' WILLINGNESS TO PARTICIPATE IN IN-SERVICE TRAINING PROGRAMMES

Teachers were asked to select factors which improve their willingness to participate in in-service training programmes. Competent resource persons involvement of trainees in the training process, consultation with teachers to assess their needs, support to teachers to implement new ideas/innovations acquired in in-service training programmes emerged as the most important factors in improving willingness of teachers to undergo in-service training programmes. Daresh (1987) reviewed 160 studies in the areas of in-service education of teachers and concluded that staff development and in-service education is viewed as more effective when content is based on self-reported needs of participants.

### TRAINING NEEDS OF HEAD TEACHERS

Most of the head-teachers expressed that they need training in the following areas:

- General administration
- Providing instructional support to teachers
- Team building
- Seeking community support

Chapman *et al.* (1993) in their study "Teacher Incentives in the Third World" suggested that "more attention should be given to the training of headmasters in instructional supervision techniques."

### **Perceived Social Status**

Teachers were asked to indicate as to whether their social status had declined, improved or remained the same during the last one decade. Perceptions varied not only from state to state and also between districts within a state. More than 50 per cent of the teachers in the Assam and Haryana felt that their social status has declined during the last one decade. More than two-thirds of the teachers in Karnataka, Maharashtra, Orissa and Tamil Nadu felt that their social status has improved.

Teachers were also asked to give reasons responsible for decline of social status. Salary, working conditions followed by government attitude towards primary school teachers emerged most important factors in this regard. In all fairness teachers from almost all the districts also considered lack of integrity and devotion to duty as one of the reasons for declining social status.

### **Perceived Economic Status**

Very limited number of teachers 2 to 6 per cent expressed that their economic status was high. More than 70 per cent of the teachers perceived their economic status to be moderate. Female teachers perceived their economic status better than their counterpart male teachers

### **Instructional Support**

More than 50 per cent teachers in Hisar district of Haryana, Wayanad and Mallapuram districts of Kerala, Bilaspur and Tikamgarh district of Madhya Pradesh and Dharmapuri district of Tamil Nadu reported that they were not getting any instructional support from their District Education Officer. The interview with the District Education Officers also revealed that they were busy with their administrative responsibilities and as such that they do not find adequate time to provide academic guidance to teachers. Instructional support provided by Block Education Officers was also very limited. This was because a block education officer is required to visit primary schools in a year from 30 to 120. It was the highest in the Haryana and the lowest in the Kerala. Further when a school is visited/inspected by a BEO/IO, the extent to which he/she is able to provide academic support is very limited on account of the time constraint at his/her level.

### **Teachers' Perceptions About Their Promotional Prospects**

Teachers were asked to mention as to how they perceive their promotional prospects. Data in this regard is given in Table 3.

TABLE 3  
Perceptions Regarding Promotional Prospects

<i>State</i>	<i>District</i>	<i>Bleak</i>
Assam	Karbi Anglong	92.00
	Darang	96.10
Haryana	Jind	56.00
	Hisar	62.50
Karnataka	Raichur	54.00
	Belgaum	63.00
Kerala	Wayanad	65.00
	Mallapuram	80.00
Maharashtra	Aurangabad	38.00
	Nanded	28.00
Tamil Nadu	South Arcot	69.00
	Dharmapuri	68.20
Orissa	Gajapati	20.00
	Rayagada	37.00
Madhya Pradesh	Betul	67.00
	Bilaspur	59.00
	Ratlam	78.00
	Sehore	66.00
	Tikamgarh	58.00

More than 90 per cent of the teachers in Assam, and 50 per cent in Haryana, Kerala, Tamil Nadu, and Madhya Pradesh reported that their chances for promotion were bleak. In Maharashtra and Orissa, the percentage of such teachers was between 20 to 38. When teachers feel stranded in a dead-end position with few opportunities for growth or expectancy of reward, it is difficult to sustain their motivation for improved performance. Engelking (1987) also observed that keeping teachers motivated once they are in the profession is a growing problem. Job stress, alienation, frustrating working conditions all contribute to this lack of motivation. Career rewards and work rewards make the teaching profession a more attractive occupation and keep teachers motivated.

### Problems of Female Teachers

Majority of the female teachers in districts of Karbi, Anglong, Raichur, Belgaum, Wyanad, Gajapati, Rayagada, and Betul reported that they were finding difficulty in getting residential accommodation. The difficulty in other

districts in this regard was less pronounced. Most of the teachers expressed that they were no separate toilets for them.

### Problems in Schools

Majority of teachers from rural areas in all the districts except those of Wyanad, Mallapuram, South Arcot reported multigrade teaching, high rate of students' absenteeism as their problems. However, high rate of students' absenteeism was more pronounced in rural areas than in urban areas. Non-availability of textbooks in time was reported by almost all the urban and rural schools. The percentage of teachers who reported lack of guidance from seniors varied from district to district. Parent's apathy towards children education was reported by more teachers from rural schools than by urban schools.

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# **A Study of the Effect of Household, Community and School Factors on the Enrolment, Retention and Achievement of Scheduled Tribe Children at Primary Level**

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## **ABSTRACT**

*This study derived its data from a number of studies conducted under District Primary Education Programme (DPEP) such as Baseline Achievement Study, Tribal Study, Teacher Needs and Motivation, Household Study (Assam) and Planning for and with Tribals : The case of DPEP. The sample includes the data pertaining to Scheduled Tribe from Assam, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa and Tamil Nadu. In all, 29 districts have been represented in the sample. The study is delimited by the fact that no fresh data was collected. Inference have been drawn with respect to effect of household, community and school factors on enrolment, retention and achievement, which are cardinal concerns for universal elementary education. The study brings out the need for making tribe as specific unit for planning and decentralization of curriculum development and implementation. It also brings out the need for greater community participation by relating education to the community needs.*

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## Introduction

This is a study based on derivation of data collected for a number of studies under District Primary Education Programme (DPEP) with different sets of objectives, samples and methodologies. The purpose of taking up this study was to cull out any meaningful correlation of the household, community and school factors with enrolment, retention and achievement of the Scheduled Tribe children. The incumbent limitation set before the researchers was that no fresh data was to be collected. This then meant that the samples that were covered under different studies should be converging on particular set of children and the households, community and schools so that the data could be cross matched for a meaningful research. The studies that were to be relied upon the data were: Baseline achievement study which measured the achievement of the children in language and mathematics at the primary stage in which among all students some were tribal students, though their tribal denominations are not mentioned; Gender study which concentrated mostly on the gender issues in general and Scheduled Tribes (ST) were not covered, or are not so classified as to bring out the effect of household, community and school factors on enrolment and achievement of these children; Teacher study, which again did not concentrate on only tribal teacher but it did have some tribal teachers whose views could be relevant to the topic of the study; Assam household study, which studied the householder in the state of Assam only and which could have some tribal household included in its sample; Planning for and with tribal people — the case of DPEP, which studied the tribal profiles in some DPEP districts which studied the planning strategies adopted in case of tribal development and education in the context of the ethnographic profiles of different tribes in the districts; and, Scheduled Tribe Studies which looked at the educational needs and profiles of the scheduled tribes in selected blocks in some of the DPEP districts.

## Objectives

The objectives of this study were to find out:

- (i) If there were any effect of the household, community and school factors on the enrolment of the Scheduled Tribe children;
- (ii) If there were any effect of the household, community and school factors on the retention of Scheduled Tribe children;
- (iii) If there were any effect of the household, community and school factors on the achievement of the Scheduled Tribe children at the primary stage of education.



# EFFECT OF HOUSEHOLD, COMMUNITY AND SCHOOL FACTORS

TABLE I

**Sample Included from Baseline Achievement Study**

<i>State</i>	<i>Districts</i>	<i>Total Students</i>	<i>ST Students</i>	<i>Total Schools</i>	<i>No. of Schools With ST Students</i>	<i>Total Teachers</i>	<i>Teachers In schools With ST Students</i>
Assam	Darrang	472	38	45	6	137	19
	Morigaon	399	22	35	20	110	53
	Karbi Anglong	293	156	35	22	121	76
	Dhubri	515	98	45	30	84	70
Mahara-shtra	Nanded	610	21	44	11	139	44
	Aurangabad	746	47	41	18	130	56
	Parbhani	790	38	43	15	140	51
Orissa	Kalahandi	468	91	41	27	152	101
	Rayagada	363	26	44	15	141	48
	Gajapati	275	98	44	32	114	89
	Phulbani	258	63	35	24	98	87
Tamil Nadu	Dharmapuri	974	44	47	18	155	59
	Tiruvanna-malai	697	18	38	14	94	44
	South Arcot	652	34	31	13	96	43
Madhya Pradesh	Betul	685	79	41	24	119	61
	Ratlam	428	35	42	20	119	57
	Shahdol	406	144	45	36	86	73
	Rewa	588	50	42	19	109	57
	Sidhi	386	69	42	24	92	52
	Bilaspur	804	108	45	30	129	91
	Panna	280	41	42	18	88	42
	Dhar	472	127	41	28	106	80
	Sarguja	311	106	44	38	88	80
	Sehore	496	51	42	18	102	53
	Rajgarh	398	65	42	21	81	48
	Rajnandgaon	607	71	42	26	106	70
Karnataka	Kolar	550	96	45	-	109	-
	Raichur	580	70	43	-	88	-
Kerala	Wayanad	1129	170	40	-	187	-
Total		15623	2076	1205	567	3320	1604

# EFFECT OF HOUSEHOLD, COMMUNITY AND SCHOOL FACTORS

TABLE 2

## Sample Included from Tribal Study

State	District	Teacher	Head Teacher	Village Head	Parents	Community Leader	Learner School Going	Learner not School Going
Assam	Darrang Morigaon	27	10	10	100	50	103	71
		14	7	10	101	46	109	78
Karnataka	Kolar Raichur	20	10	10	100	40	109	88
		28	10	10	100	40	120	80
Kerala	Kasargod Wayanad	60	10	10	100	50	120	66
		60	10	10	100	50	120	36
Madhya Pradesh	Beatul	22	10	10	109	10	120	80
	Ratlam	27	10	10	110	10	119	80
	Raigarh	26	10	10	105	10	120	79
	Shahdol	21	8	9	104	10	113	70
Maharashtra	Nanded	30	16	10	100	30	121	55
Orissa	Kalahandi Rayagada	18	17	10	98	40	36	127
		17	16	10	100	40	78	121
Tamil Nadu	Dharmapuri	80	10	10	100	50	120	80
	Thiruvannamalai	88	10	10	100	50	118	79

Given the objectives the research questions that were framed were:

1. Are the villages/blocks which are common to all DPEP studies can be considered for this derivative study?
2. Can the proposed study throw some light on educational indicators, viz., enrolment, retention, and achievement of the Scheduled Tribe children at the primary level of education, when all the studies are amalgamated?
3. Can the proposed study be able to cull out information relating home, community and school factors which impinge upon enrolment, retention and learning achievement of the Scheduled Tribe children at the primary level of education?
4. How best the clustering of subjects be achieved in spite of the overall objective of amalgamation so as to keep the contamination of responses — which can indicate the needs of different Scheduled Tribe communities — at a minimum?
5. Is it feasible to generalize the derived findings for all ST communities or is it feasible to assort the responses of different ST groups so as to provide

# EFFECT OF HOUSEHOLD, COMMUNITY AND SCHOOL FACTORS

TABLE 3

Variables Selected from Baseline Study

<i>Factors</i>	<i>Variables</i>	<i>Variables Description</i>
Household	Sex	Boys=1, Girls=2
	Sibling	Addition of brother, sister and cousins staying in the family
	Family Size	Addition of total Family Members
	Parent Education	Illiterate=1, Up to H.Sec. =2, College=3
	Father Occupation	Farmer=1, Agriculture & Unskilled Labour=2, Skilled Worker=3, Other=4.
	Mother Occupation	Housewife=1, Cultivation=2, Agric. and Unskilled labour=3, Other=4
	Academic Help Received from Family	Help received=1, No help=2
School	Availability of Food	Always=1, Sometimes=2, Never=3
	Mid-Day Meal	Not Applicable=0, Avail. and Satisfied=2, Not Getting=3
	Repeater	Not Repeat=1, Repeat=2
	Teacher Attendance	Everyday=1, Most Days=2, Sometimes=3, Rarely=4
	Maths Problems Given	Everyday=1, Sometimes=2, Never=3
	Knowledge of Result Provided	Always=1, Sometimes=2, Never=3
	Teacher Gives Home Work	Regularly=1, Sometimes=2, Never=3
	Teacher Corrects Home Work	Always=1, Sometimes=2, Never=3
	Reading Other Books	Yes=1, No=2

specific ST status/needs which can be much more meaningful as each ST group is ethnologically distinct from the other?

## Limitations

The limitations of this study are many. The sample covered by different studies do not converge. So the results obtained from them cannot be zeroed in. It has to ignore the focus, sample, methodologies and the tools of these studies, except of course to analyze the tools to find out the ST discrimination and responses for purposes of data retrieval. The desired point of convergence of all studies on same geographic unit or the learners is not possible. Therefore the efforts have to be made to relate the data to likely tribe, based on the assumption that if a particular district is common the predominant tribe inhabiting the district would have been covered in the samples of different studies and the data may be representing their characteristics. This is a serious

# EFFECT OF HOUSEHOLD, COMMUNITY AND SCHOOL FACTORS

TABLE 4

## Variables Selected from Tribal Study

Factors	Variables	Variables Description
Household	Family Income	Less than 500=1, Less than 1000=2, 1000 or more=3
	Occupation of Parents	Cultivation=1, Manual Work=2, Household Work=3, Self employment=4, Govt Service=5
	Parents' Perception about School	
	School Time Suits Children	Yes=1, No=2
	Like School System	Yes=1, No=2
	Regularity of Teacher	Yes=1, No=2
	Participate in School Function	Yes=1, No=2
	Regional Language as Medium of Instruction	Yes=1, No=2
	Tribal Dialect as Medium of Instruction	Yes=1, No=2
	Familiarity with Incentive Scheme	Yes=1, No=2
	Enrolment	GER was calculated
	Dropout	Dropout rate as given by the teacher
	Teacher Qualification	Below Matric=1, High Sec=2, Graduate & above=3
	Teacher Training	Yes=1, No=2
	Incentive Available in Time	Yes=1, No=2
School	Preschool Facility	Yes=1, No=2
	Incentives	Total Number of items available under the scheme was counted.
	Curriculum	State=1, Tribal=2
	Teaching Medium	Tribal=1, Regional=2, Both=3
	Book Suitability	Yes=1, No=2
	Books Comprehensibility	Yes=1, No=2
	Too Much Home work	Yes=1, No=2
	BEO Supervised	Yes=1, No=2
	DEO Supervised	Yes=1, No=2
	Dy Director Supervised	Yes=1, No=2

## EFFECT OF HOUSEHOLD, COMMUNITY AND SCHOOL FACTORS

<i>Factors</i>	<i>Variables</i>	<i>Variables Description</i>
Communi- nity	Village Education Committee	Yes=1, No=2
	Active Participation of VEC	Yes=1, No=2
	Freq. of Participation	No Participation = 1, More than once = 2, Once in a Year=3
	NGO working	Yes=1, No=2
	Village Head Cordination	Yes=1, No=2
	VEC Coordination	Yes=1, No=2
	Panchayat coordination	Yes=1, No=2
	Community Leader Coordination	Yes=1, No=2

limitation and a forced assumption has been made as stated above. The sample is, therefore, incidental in this study and has been taken as a given condition.

### Methodology

The samples of all the studies were examined to find out if any two studies had covered the same learner or village or block or the district or the state. This convergence was found only at the district level and not even at the block level let alone the village or the learner level. Thus the answer to the first research question was in the negative.

Instruments and tools of all these studies were analyzed to cull out the data pertaining to ST communities from those items that gives ST discrimination. The data from different studies were pooled together and they were classified as pertaining to household, community or school factors. Some of the items were such that transcended such categories and therefore were considered for more than one category, if necessary. The data were analyzed and statistically treated, wherever possible, by using analysis of variance, Chi-square for high, average and low achievement groups and Pearson product moment correlation for significant association between household, community and school factors with achievement in language and mathematics.

It may be mentioned that some of the studies did not yield data that could be subjected to statistical analysis except that in percentages. Nonetheless they provided rich information in ethnographic and demographic details that has provided insights into the why of the phenomenon! That has provided the meat to this study and which needs to be considered for any meaningful intervention.

Other published literature related to the tribe in particular or education of the tribal communities have also provided insights into the causal factors of

certain observed phenomena, and have been relied upon drawing the findings and conclusions.

Three major variables — enrolment, dropout (converted into retention) and achievement — were linked with different household, community and school factors. Achievement of only ST students were selected from pupil file of the baseline study referred to above. On the basis of school code where achievement marks of ST students were available corresponding schools and teachers were selected. The household and school factors identified in the pupil schedules (who were present) were analyzed, keeping pupil as unit. To draw more factors related to school and teachers, the achievement marks of the pupil were aggregated at the school level. These factors were analyzed in relation to the mean achievement of the students at school level keeping the school as unit. At pupil level and school levels, the samples of less than 30 and 20 respectively were excluded in the analysis

Factors related to enrolment and retention of ST children were selected from the ST Study mentioned earlier. In this study the respondents were teachers, head teacher, village head, community leader, learner attending schools or Non-formal Education (NFE) Centre or children not attending the school or NFE Centre. The relevant data were matched together from different instruments and analyzed separately in terms of selected variables.

### *Sample*

The samples covered are purely incidental and retrieved from different studies and are given in Tables 1 and 2.

### *Variables*

From both the studies variables related to household, community and school factors were selected and statistical analysis was done to explore the effects on enrolment, retention and dropout of ST students. The variables selected are given in Tables 3 and 4.

### *Findings*

#### ENROLMENT

##### ASSAM

In the district of Darrang and Morigaon in Assam no significant P-value is obtained on the variables of boys and girls. However, 52.7 per cent boys and 47.3 per cent girls in Darrang are in high attendance category followed by 50

per cent each in average attendance group.

Similar is the situation in Morigaon with slight variation. The P-value is found to be significant at 0.01 level only in the case of parents reporting participation of children in NFE in the district of Darrang, and that such parents are in income groups which have to depend on supplementing it with child's contribution.

Eighty per cent of the schools have reported active participation of the community in high ST enrolment, 54.5 in average ST enrolment and 40 per cent in low ST enrolment schools.

The school factors have the variables of curriculum, whether state or tribe specific, medium of instruction, whether state language or tribal language or both, suitability of books and home workload. The profile in the two districts of the state are different. In Darrang the state curriculum is followed while in Morigaon it is reported to be tribal, in Darrang the medium of instruction is State language while in Morigaon it is reported to be tribal.

Most of the teachers are trained (pedagogic training), and the supervision is reportedly adequate.

#### KARNATAKA

In Karnataka, we do not find any significant P-value for school attendance of boys and girls in high, average and low attendance categories. In high attendance schools in Kolar, 54.6 per cent boys and 45.4 per cent girls are enrolled while there are 33.3 per cent and 66.7 per cent respectively in average attendance schools. In low attendance schools this ratio is 55.6 to 44.4. Almost similar is the situation in the district of Raichur.

In both the districts it is noticed that a large percentage of the parents irrespective of their occupational groups are desirous of sending their children to higher education.

The major tribal group being the Naikda in both the districts, it can be safely said that the pattern emerging is very much due to contact situation with the non-tribal groups which is a very significant characteristic of this tribal community.

The analysis of data regarding parents perception about the school and child attending school reveals two significant P-values in Kolar District, namely, "regularity of teacher" (0.05 level) and "familiarity with incentive scheme" (0.001 level). The school timings and textbooks have been reported suitable and schools are liked in both the districts.

Tribal dialect is not the medium of instruction in either of these districts.

## EFFECT OF HOUSEHOLD, COMMUNITY AND SCHOOL FACTORS

In spite of the existence of the Village Education Committees, community participation in the school affairs is reported to be low.

The incentives in these schools are rather low, the mean scores varying between 3.25 and 2.5 and their availability in time is also a matter of concern.

Pre-school facility is also wanting in these areas.

The curriculum followed is the State curriculum, but some of the schools report the tribal language as the medium of instruction (50 % in average enrolment and 18.8 per cent in low enrolment schools) while in some of the schools both the regional and the tribal language is the medium of instruction (25 per cent low enrolment schools). There is no home work load and the books are reported to be comprehensible by 75.25 per cent and 50.50 per cent in average and low enrolment schools respectively. The difference in the scenario in the district of Raichur, is not much.

The teachers are qualified and reported to be trained in the conventional sense. The local level supervision is reported to be adequate in Kolar but not so in Raichur.

### KERALA

In Kerala, when we examine the ST data from the point of view of school attendance from gender perspective, we find that no significant P-value is exhibited of high, average or low attendance on gender variables either in Kasargod or in Wayanad district. High attendance schools have 45.9 per cent tribal boys and 54.1 per cent tribal girls out of the total tribal enrolment. The average attendance school in this district has 77.8 per cent and 27.2 per cent boys and girls respectively (7 and 2 in no.) and in low attendance school 100 per cent are girls (2 in No.) In Wayanad the respective boys and girls enrolment is: High attendance — 57.9 and 42.1 per cent, average girls only and low — 33.3 and 66.7 per cent.

The occupation of the parents and the enrolment of the children gives the following picture in Kasargod: 63.6 per cent cultivators, 43.1 per cent manual workers, 100 per cent each household workers and service class parents send their children to the school.

Enrolment of children in the pre-school is relatively low among all these categories of parents. The situation in Wayanad is not very different.

The family income and enrolment of children does not show any significant P-value but it is seen that low income group has less participation of the children in the school, as reported by the parents in both the districts, and yet the parents' aspirations for higher education is high.



Suitability of school timings is not the problem with those whose children are attending the schooling in both the districts. Same is true for liking the school or the regularity of the teacher.

Participation of the parents in school affairs is low in Kasargod than in Wayanad. Regional language is reported to be the sole medium of instruction in Kasargod while it is largely so in Wayanad. Generally the parents are aware of the incentive schemes. VEC is not there in either of the district, but the Non Governmental Organisations (NGOs) are reported to exist by 50 per cent but without coordination between the community and the school.

The school factors that effect the enrolment rate in the district of Kasargod shows that the mean of incentives for high, average and low enrolment schools are 3.16, 3.06 and 3.28 respectively. All high enrolment schools in Kasargod get the incentives in time, 90 per cent average enrolment schools get in time and 94.4 per cent low enrolment schools do so.

The pre-school facilities are available in adequate number in such areas. Almost similar is the situation in Wayanad district.

The academic aspects in both the districts reveal that there is State curriculum, (no specific tribal curriculum). Largely the medium of instruction is the regional language, the books are reported to be suitable though a few find its comprehension and the use of regional language as medium of instruction at the initial stage a little questionable.

The teachers are qualified and trained (in conventional sense) and the supervision is pretty strong in both the districts.

#### MADHYA PRADESH

In Madhya Pradesh, the district of Betul has 51.5 per cent boys and 58.5 per cent girls while the average and the low rate attendance schools have the enrolment of boys and girls as 25 per cent and 75 per cent and 53.8 per cent and 46.2 per cent respectively. In the district of Ratlam the distribution in that order is 49.1 and 50.9; 33.3 and 66.7; and 66.7 and 33.3 respectively. The situation in Raigarh is almost similar with 51.9 per cent boys and 48.5 per cent girls; 58.3 per cent and 41.7 per cent and 14.3 per cent and 85.7 per cent respectively. The situation in Shahdol is also not very different. There is no significant P-value. In Betul 47.5 per cent cultivator parents send their children to the school while 38.6 per cent manual workers and 83.3 per cent service class parents do so.

Only 3.4 per cent cultivators send their children to NFE centres. Most of them want their children to go for higher education and 13.6 per cent

cultivators, 18.2 per cent manual workers and 50 per cent service class people send their children to pre-schools. In Ratlam, which is a Bhil area, position is not much different except that larger percentage of parents send their children to pre-schools. None of the P-values is significant and not much different profile can be drawn about enrolment among the Gonds of Betul and Bhils of Ratlam. The case of Raigarh is not much different either except that none of these parents is sending his/her child to NFE though 3.3 per cent have been sending their children to NFE centre. When we look at the family income as a factor on variables of attendance in schools, NFE centres, pre-school institutions and aspiration for higher education we do not find any significant P-value. Families income ranging below Rs. 500 in Betul, Ratlam, Raigarh and Shahdol 45.1 per cent, 29.9 per cent, 31.4 per cent and 53.6 per cent respectively send their children to schools. Of those of the same family income, very few send their children to NFE centres.

The parents' perception about schools and child attending school shows that in Betul, three factors show significant P-values at 0.01 level each. They are suitability of school timings, participation in school functions and medium of instruction. All respondents find that school timings suit the children, the participation in school is almost evenly divided into yes and no response and tribal dialect is not the medium of instruction in this district. Comparing the latter with situation in Ratlam, we find the situation just similar as 95 per cent say the regional language is the medium of instruction and only 5 per cent say it is not and same number say the tribal language is used as medium of instruction. So is the case in Raigarh and Shahdol.

All the districts report existence of Village Education Committee but its active participation is denied by most of the schools, whether of high, average or low enrolment rates.

Except for Raigarh, nowhere any NGO is reported. Neither any kind of coordination of schools with Panchayat or Village Head or community leaders has been reported by the village heads.

The mean score for number of incentives available in the four districts of MP are Betul 4.00 for high enrolment schools, 2.28 for average enrolment schools and 2.00 for low enrolment schools, in Ratlam it is 2.00, 2.60, 2.33 in that order, in Raigarh it stands at 3.0, 2.0, 3.4 and in Shahdol it is 4.0, 4.25 and 3.50 respectively. A tentative conclusion can be drawn that greater number of incentive schemes have some kind of correlation, however faint with enrolment rates. In the districts of Shahdol and Raigarh it needs to be rejuvenated so that it is available to the schools in time.

Preschool facility is almost nil in all the four districts.

A look at the curriculum will reveal that all institutions with an exception of

one or two institutions report state curriculum in all the four districts. However, some redeeming trend is discerned when there is report of tribal language being used as medium of instruction in some schools of Betul and Ratlam, but the relationship with high average or low enrolment is not established.

The suitability of books is reported in affirmative by a large section of respondents as compared to those who have responded in negative, in the district of Betul, Ratlam and Shahdol, but all responses are in affirmative in Raigarh. Similar trend is seen with regard to comprehensibility of books in Raigarh, Betul, Ratlam and Shahdol. But in Shahdol the P-value for comprehensibility of books is found to be significant at 0.05 level. The school supervision by different level of officers and Village Education Committee is in a happier state than in many of the other states.

#### MAHARASHTRA

In Maharashtra, only one district has been covered under the ST study, i.e., Nanded. And the ratio of boys and girls in high attendance rate school is 45.8 : 54.2 per cent, in average attendance rate school only tribal boys are enrolled and in low attendance school, only girls are enrolled.

Nanded does not seem to have NFE centre whereas almost all cultivators send their children to school, about 52 per cent send their children to preschool and 88.7 per cent of the manual workers, send their children to school and 35.5 per cent send them to preschool. The position of self-employed is such that 66.7 per cent parents are sending their children to the school and 50 per cent to pre-school.

It is revealed that income group makes no difference in participation level of the children in schooling and irrespective of it all of them again exhibit aspiration for higher education.

All parents find that the school timings are suitable for children and they report that teachers are regular. Therefore teacher absenteeism is not the problem in this district. The liking for the school system is by about two-thirds of the respondents. The remaining one-third do not like the school system. Seventy-five per cent of the respondents report the regional language to be the medium of instruction and 25 per cent deny the same. The tribal dialect as a medium of instruction is reported by about one-third of the respondents. Eighty-six per cent are familiar with the various incentive scheme in the district. The P-value for "school timing" and "regularity of teacher" are significant at 0.01 level while it is significant at 0.05 level for variables "liking the school system" and "familiarity with incentive schemes".

The existence of Village Education Committee is reported in all the school areas but its active participation in school affair has mixed response, and its P-value is significant at 0.05 level. The frequency of participation varies from none to once in a year, wherever such participation exist. It may be relevant to mention that high enrolment rate school report total non-participation of the Village Education Committee and low enrolment school report total participation of the VEC. While average enrolment school have a mixed ratio, the participation shows an inverse relation with enrolment (!)

The mean score for the incentives available in this district are 2.0 for high, 2.92 for average and 3.0 for low enrolment rate school respectively, which indicates that the number of incentive schemes go on increasing as we move from high to low enrolment rate school. The facilities are not available in time in high enrolment schools. In average and low enrolment they are almost evenly divided in "yes" and "no" responses. Largely, preschool facility is not available.

The other school factor, the "academic aspect of school" on analysis shows that there is no tribal curriculum, the medium of instruction is largely regional language, the books are not suitable as per majority of responses and so is the comprehensibility of the book. Homework is not heavy, the teachers are qualified and are trained to a large extent.

School supervision is satisfactory as reported by the head teacher because both Block Education Officer and Village Education Committee have supervised all the schools.

#### ORISSA

In Kalahandi district, the boys' enrolment is 75 per cent in high attendance rate schools, while it is 25 per cent for girls. Compared to that boys and girls enrolment is 60.9 and 39.1 in Rayagada. In average attendance rate school, two-thirds are boys and one-third are girls while in Rayagada only one boy was enrolled. In the low attendance rate school, Kalahandi has boys girls in 40:60 ratio. Reverse is the case in Rayagada. The P-values are also not significant.

In the district of Kalahandi the variable of attendance in preschool, and the occupational groups of parents show a significant variable of 0.01 level. One thing that stands out is that aspiration level for higher education is strikingly high in Rayagada district and is fairly high in Kalahandi district. NFE centres seem to be functioning in both the districts, though with low participation as reported by teachers. Same is true for preschools. Parents' perception about school and child attending the school has significant P-value on the variables participation in school function at 0.01 level, regional language as medium of instruction at 0.01 level in Kalahandi district and school and

school time suiting children at 0.01 level and liking the school system at 0.01 level in Rayagada.

Tribal dialect as medium of instruction is not used in Rayagada while it is sparingly used in Kalahandi.

The teachers are mostly regular in Kalahandi while about half are not regular in Rayagada.

The Village Education Committee exists in Kalahandi in majority of the schools whether high average or low enrolment while it exists mostly in low enrolment rate schools in Rayagada. Active participation of VEC is evenly divided in "yes" and "no" response in Kalahandi while it is one-third "yes" and two-thirds "no" in Rayagada. All the village heads reported existence of NGOs in Kalahandi. Only 40 per cent reported so in Rayagada.

The mean of incentives is dismally low in Kalahandi and Rayagada both indicating that more extension of schemes in this area is of utmost urgency. There is also great need of making this facility available to the people in time in both the districts.

There is no preschool facility in either of the districts.

In most cases the curriculum followed is that of the state in these two districts. Almost similar is the situation with regard to use of regional language as medium of instruction. The suitability of books has been reported in affirmative by all category of schools in Kalahandi and the relevant category in Rayagada. While comprehension of the books is evenly divided in "yes" and "no" response, in the low enrolment schools in Rayagada, it is not comprehensible in Kalahandi district. Most of the teachers are trained in the two districts.

In Kalahandi, the teacher qualification is largely Higher Secondary and above, yet there are few (about one-third) who are below HSC. Same is true in Rayagada.

#### TAMIL NADU

In both the districts of Dharmapuri and Thiruvannamalai, the enrolment of boys and girls are almost evenly divided in high enrolment schools. In average enrolment rate schools there is a lone girl in Thiruvannamalai. In low enrolment rate school there is a lone boy in Dharmapuri while in Thiruvannamalai the ratio is 60:40. In Dharmapuri 53.7 per cent of cultivators send their children to school, as compared to 50 per cent in Thiruvannamalai. None of the cultivators send their children to NFEC (perhaps there is no NFEC) in Dharmapuri, 6.5 per cent cultivators in Thiruvannamalai send their children to NFEC. All the Dharmapuri cultivators aspire for higher studies for their

children, while most of them do so in Thiruvannamalai. Almost similar is the situation with manual workers in both the districts. Almost similar picture emerges when attendance of school children is considered on the parameters of income groups as per parents' responses.

The P-values are significant at 0.01 level on the variable of participation in school function in Dharmapuri and school timing suiting children at 0.05 level in Thiruvannamalai. There is hardly any difference in response patterns in the two districts on the various variables.

The NGOs existence has been reported by 20 per cent of the village heads in Dharmapuri and 50 per cent in Thiruvannamalai. Dharmapuri records 10 per cent community leader co-ordination with the school, which Thiruvannamalai records at 20 per cent village heads co-ordination with school. The mean of incentive schemes being made available to high, average, low enrolment rate schools indicates the following position. In Dharmapuri it is 4.36, 4.62 and 4.00 for high average and low enrolment rate schools respectively. The position in Thiruvannamalai is 3.4, 4.3 and 4.5 in that order. While in Thiruvannamalai these facilities are available in time in most of the cases, it is not so in Dharmapuri.

Preschool facility is not available in either of the two districts and it needs to be extended to these areas with certain degree of urgency.

In both districts the curriculum followed is of the state, the medium of instruction is the regional language, the books are reported to be suitable in majority of the cases and the comprehensibility of the book is also reported to be of fairly high order in both the districts. Homework load is not too much.

Most of the teachers are trained and qualified at higher secondary level, in both the districts. The supervision by the Block Education Officer is only 50 per cent in both the districts as reported by the Head Teacher of the schools, while the supervision by the District Education Officer is reported by 90 per cent of the respondent

## RETENTION

### ASSAM

In Assam the occupation patterns of the parents and children not attending school (percentage of parents' response), reveals that the P-value is only significant in case of NFE centre in Darrang district, while in all others cases in both the districts it is not significant. In Darrang 20.8 per cent cultivator parents report that their children are not going to school, 30 per cent of manual workers, 28.6 per cent of household workers, 80 per cent of self-employed,

and 33.3 per cent of service class are not sending their children to schools. 84.7 per cent cultivators, 70 per cent of manual workers, 100 per cent of household workers, 20 per cent of self-employed and 100 per cent of service class parents do not send their children to NFE centres. Similarly 52.8 per cent cultivators, 70 per cent manual worker, 85.7 per cent household workers, 80 per cent self-employed and 83.3 per cent service class parents do not send their children to preschool institution in Darrang district. One cultivator parent reported that he did not aspire high education for his children.

In Morigaon, 37.5 per cent cultivators and 16.7 per cent manual workers are not sending their children to school; 96.6 per cent cultivators, 100 per cent service class parents are not sending their children to NFE centres; 86.4 per cent cultivators, 66.7 per cent manual workers, 100 per cent self-employed, 100 per cent service class parents are not sending their children to preschool institutions. Here too, 1.2 per cent cultivator parents do not aspire for higher education of their children. Significant P-value is exhibited at the level of 0.01 in case of variable "not going to NFEC" in Darrang district. A study of percentages of parents responses shows that 32 per cent of parents with income less than Rs. 500 p.m. do not send their children to schools, so do 15 per cent in income bracket of Rs. 500 to 1000 and 40 per cent in the income range of more than Rs. 1000. Seventy per cent of parents in less than Rs. 500 income do not send their children to NFE centres, 92.5 per cent parents with income of Rs. 500-1000 p.m. do the same. 2.6 per cent in middle income range (Rs. 500-1000 p.m.) do not aspire for higher education of their children. 52, 65 and 80 per cent of low, middle and high income ranges indicated above do not send their children to preschool institutions. In Morigaon district, variable "not going to school" exhibits significant P-value on income groups stated above at 0.05 level, where 41.4 per cent of low income and 20.0 per cent of middle income range do not send their children to schools. 95.7 per cent of the low income, 100 per cent of the middle range income and 100 per cent high range income parents do not send their children to NFE centres. 1.4 per cent low income range parent do not aspire for higher education. 82.9 per cent of low income range parents, 92.0 per cent middle range income parents and 100 per cent high income range parents do not send their children to preschool institutions.

When we look at the parents' perception about the school and the child not attending the school we have the variables similar to those described under enrolment. We do not find any significant P-value in either Darrang or Morigaon.

With regard to the tribal dialect as medium of instruction in Darrang (22.2 per cent) and Morigaon (89.7 per cent) a similar confusion seems to persist as pointed out under enrolment. The existence of VEC has a significant (0.05 level) P-value in Morigaon, but no other factor shows any significant P-value

in either of the two districts.

52.9 per cent schools with no dropout have active participation of the community, 80 per cent schools with 0-10 per cent dropout have active participation of the community and 25 per cent schools with 10 per cent and above dropout have active participation of the community. In Morigaon the schools having upto 10 per cent dropout show active participation of VEC to the extent of 27.3 per cent and schools with above 10 per cent dropout show 66.7 per cent participation of VEC.

In Darrang district the school factors and dropout rates have significant P-value at 0.05 level as far as availability of incentives in time is concerned. The mean scores of the incentives in "no-dropout" schools is 1.44, "upto 10 per cent dropout" schools is 3.00 and above 10 per cent dropout schools again is 3.00. 27.5 per cent "no dropout" schools have incentives available in time and 72.2 per cent do not have them in time. "upto 10 per cent dropout" schools have incentives in time in 40 per cent cases and remaining 60 per cent do not have in time and more than "10 per cent dropout" schools have them in time. So the trend do not indicate that availability of incentives in time have any relationship with retention. In Morigaon the mean scores of incentives for "no dropout" (full retention) school, upto 10 per cent dropout (retention 90 per cent and above) and more than 10 per cent dropout (less than 90 per cent retention) are nil, 1.45 and 2.00 respectively. So provision of incentive and dropout show an inverse trend, which is substantiated by the trend exhibited by the timely availability of the incentives. The P-value for medium of instruction is significant at 0.01 level, suitability of books at 0.05 level comprehension of books again at 0.05 level. An analysis of the percentages reveal that tribal language as medium of instruction for retention rate above 90 per cent or more is 100 per cent and less than 90 per cent retention 50 per cent while regional language is 50 per cent in this retention rate institutions. The suitability of the books is reported and 27.3 per cent in affirmative by above 90 per cent retention rate schools and 72.3 per cent in negative. Less than 90 per cent retention schools reports non-suitability in 100 per cent cases. Similar trend is exhibited by these categories of schools in matters of comprehension of the books.

The reasons for dropout as indicated in Darrang district are for boys (N=53) "illness" 26.3 per cent, for "helping parents" 52.6 per cent, "teacher did not help" 5.3 per cent, "non availability of textbooks" and "irregularity of teacher" 50.5 per cent. In case of girls (N=20) 10 per cent dropouts are due to "illness", 55 per cent for "helping parents", 5 per cent for "looking after the siblings", 5 per cent "classmates not being friendly", 10 per cent "teacher did not help", 5 per cent "books not available", and 10 per cent "teacher not regular". In Morigaon 60.6 per cent dropped out due to illness, 21.2 per cent for helping parents, 3.0 per cent for looking after siblings, 6.1 per cent for unfriendly



classmates, 9.1 per cent did not like school, 15.2 per cent did not have books, 6.1 per cent did not do homework. 9.1 per cent due to fear of punishment. In case of girls illness accounted for 86.4 per cent dropouts. 9.1 per cent for helping parents, 4.5 per cent did not like the school, 4.5 per cent did not get help from teachers, 4.5 per cent did not get textbooks and same 4.5 per cent feared punishment. The enquiry from non-attending children about their intention to rejoin the school revealed that very little boys and girls in both districts were sure to return to school, and almost similar is the position with those who were certain that they won't, whereas maximum were no response category.

#### KARNATAKA

In Karnataka, when we take a look at the parents' response whose children are not attending school we do not notice any significant P-value either for Kolar or Raichur districts. It is revealed that 68.3 per cent of cultivators do not send their children to school in Kolar while 78.4 per cent do not send them to school in Raichur district; none of them send them to NFE Centre either in the two districts, 73.3 per cent in Kolar and 68.0 per cent in Raichur reported that their children are not attending preschool. Almost similar is the position in case of manual worker parents, household worker parents, self-employed workers and service class parents. Aspiration for higher education does exist as very small percentage do not aspire for higher education.

When we look at the family income and non-attending children as per their parents' responses in Karnataka we find almost similar pattern in the two districts in less than Rs 500 p.m. income. Similarly, in income range of Rs. 500-1000 p.m. or Rs. 1000 and above indication of similar trend as in the case of non-attendance in school (68.4 per cent and 74.7 per cent, NFEC, (100 per cent each).

The study of non-attendance in schools due to various kinds of perceptions of those parents whose children are not attending schools reveals that regularity of teacher (P-value at 0.05 level), familiarity with incentive schemes (P-value at 0.001 level) in Kolar district have exhibited significant P-values; 87 per cent parents report that the teachers are regular, 52.6 per cent are familiar with the incentives, 83.9 per cent report that the school timings are suitable for children. The only factor that stands out is that tribal language is not reported to be the medium of instruction and therefore, this perhaps could be attributed as one of the causes for non-attendance.

Similar trends are seen in Raichur too, where only 35.4 per cent parents know about the existence of incentive schemes for education of their children. The community's participation in 0-15 dropout or 85 per cent (retention),

## EFFECT OF HOUSEHOLD, COMMUNITY AND SCHOOL FACTORS

dropout 15-25 per cent i.e. 75 per cent (retention rate) and more than 25-50 per cent dropout (50 per cent retention) schools indicates participation of the community is minimal in the affairs of the schools of any of the three categories. In Kolar mean score for high retention group school is 2.28; medium retention group 2.66 and low retention group 3.25 for incentives. It may be clarified here that the mean stand for mean score of number of schemes available in a school of the particular group. There are about 11 incentive schemes that are in vogue ranging from free books, free meals to free chappals, etc. The availability of these in time is a matter of concern in Kolar. In Raichur the mean are 3.80, 3.80 and 3.25 indicating that there are more schemes than in Kolar but timely availability needs pep-up.

State curriculum is followed in both the districts, with regional medium of instruction, the comprehensibility of books presents an interesting picture in Kolar. High retention schools report greater incomprehensibility than medium and low retention schools. Could we infer that those who did not understand have already dropped out? But such is not the case in Raichur where comprehensibility of the book is rather high in all the three categories. Teacher quality indicates that they are qualified and trained.

A look at the instrument and response pattern indicates that training is in pedagogy and no training in tribal life, tribal culture is provided, and hence appreciation of tribal life, culture, values, etc., is questionable.

The boys and girls who have dropped out of the school in the two districts have indicated reasons for their doing so. In Kolar illness is the major cause of dropout among both the boys and the girls. In Kolar, 62.8 per cent boys wish to return to school sometime, while 53.3 per cent girls do so. 9.3 per cent boys and 8.9 per cent girls do not wish to come back while 77.9 per cent boys and 37.8 per cent girls have not responded. In Raichur 42.5 per cent boys and girls each wish to return to school while 57.5 per cent do not.

### KERALA

In Kasargod district 36.4 per cent cultivators, 56.9 per cent manual workers, 100 per cent self-employed parents are not sending their children to school, none is sending to NFE centre (there is no NFE centre in the area). 86.4 per cent cultivators, 87.7 per cent manual workers and 100 per cent self-employed workers are not sending them to preschool either. 13.6 per cent cultivators and 11.1 per cent manual workers do not aspire for higher education of their children.

Similar situation exists in Wynad where manual labours present such a picture. One might recall that in Wynad most of the tribals are plantation labourers. Further it is revealed that most of those who are not availing educational facilities are in the income range of less than Rs. 500 p.m. with very few in Rs.

500-1000 p.m. range in both these districts. Participation in school functions is reported by parents in Wynad in greater degree than in Kasargod.

Tribal dialect is also not the medium of instruction to a large extent. Familiarity with incentive schemes in both the districts is high and yet participation level in school programmes is not that marked. As usual the community's participation (through VEC of course) is lacking perhaps because village education committee does not exist. In Wynad district the mean of incentives is 3.08 in 9 per cent retention, 3.13 in 94 per cent retention and 3.18 in 90 per cent retention rate schools. The incentives are usually available in time and also there is an indication that preschool facilities are available in some areas in the district. The curriculum is State curriculum with regional language as the medium of instruction. Some schools with retention rates upto 94 per cent and 90 per cent indicate the use of Tribal language as the medium of instruction and this shows a significant P-value at 0.01 level, it is higher in higher retention schools. Similarly the homework load is reported in last group of schools and the significant P-value is at 0.05 level. However, looking at the percentages one can generalize that the use of tribal dialects is a welcome feature.

In Kasargod the mean of incentive schemes are similar, i.e., 3.11, 3.08, and 3.33 for 94 per cent retention, 90 per cent retention, 50 per cent retention schools. These incentives are available in time in most cases, and existence of preschool facilities are also fairly available. Here too in few cases tribal dialect is used and the retention is higher wherever this is used. Use of tribal dialect shows a positive relationship with retention rate of the school. The suitability of books does not reveal any kind of relationship with retention rate, neither does the comprehensibility of the books. Teacher qualification and retention rate are also not very positively related.

Illness, once again, is the major cause of dropout among boys and girls in Kasargod and Wynad. Other factors are absent in Wynad though helping parents, looking after siblings and teaching not satisfactory have been reported in Kasargod by small number of respondents.

Willingness to return to school by dropout children (58.3 per cent boys, 70 per cent girls of Kasargod and 47.6 per cent boys and 64.7 per cent of Wynad) gives us hope that all is not lost in tribal areas if proper interventions based on specific need of the particular tribe are planned and implemented.

#### MADHYA PRADESH

52.5 per cent cultivators in Betul, 61.2 per cent in Ratlam, 66.2 per cent in Raigarh and 35.0 per cent in Shahdol are not sending their children to school. Similarly 96.6 per cent in Betul, 93.9 per cent in Ratlam, 100 per cent in Raigarh and 96.7

per cent in Shahdol do not send them to NFEC either. It may be seen that the NFE centres are also not able to attract the out of school children for whom the scheme was introduced. This indicates that there is a need to investigate why such a large number of parents are not sending their children to the NFE centres and chalk out suitable strategies to modify the planning and implementation of NFE centres in Madhya Pradesh. The participation in preschools also is none too happy either. A look at the aspirations for higher education for children indicates that there is desire/motivation for higher education of their children. Therefore, the reasons for non-participation seem to emanate from the system itself. A total fresh look is required in Madhya Pradesh, particularly in tribal areas.

When we analyse similar responses on some variables in relation to family income groups we still get a similar picture which goes on to support our conclusions above.

The parents' perception about school and child not attending school reveals that school timing suit the children. It has significant P-value at 0.01 level in three out of four districts covered under study as responded by parents of children who are not attending the school in all the four districts of MP. The general perception of the educationists that the school timings do not suit the children is belied. These parents also show liking for the school system and yet are not sending them to schools. The teachers are also reported to be fairly regular in all the four districts.

Very few parents participate in school functions in almost all the district except in Ratlam. In Betul this reveals a significant P-value at 0.01 level.

The position of tribal dialect as medium of instruction reveals that it is abysmally low in Betul, Raigarh and Shahdol while it is not used in Ratlam. Another reason could be the non-familiarity of various incentive schemes for the education of tribals which again points an indicator for action plans.

The existence of Village Education Committee (VEC) is reported in Betul by 6 school areas out of ten, in Ratlam by 5 school areas, by all in Raigarh and by 8 in Shahdol. Their participation in school affairs varies. But no definite conclusion can be drawn as to the involvement of the village education committee with reduced dropout or high retention. This could be a factor to influence retention rates but no significant P-value is seen to draw a definitive conclusion.

Various school factors that impinge on dropout rates does not show any significant P-value. The mean score of incentives available in Betul shows relatively more incentive schemes than Ratlam. But it cannot be inferred that more schemes result in greater retention. Such a trend is not discernible in any significant measure in any of the four districts of Madhya Pradesh.

State curriculum is almost invariably followed in all the districts which indicates that there is no decentralized curriculum for specific tribal concentration areas in MP or for that matter in any other state. But unlike other states, Madhya Pradesh uses tribal language as medium of instruction in considerable areas but

no relationship with the use of tribal language as medium of instruction with retention can be discerned in any of the districts.

There is something wanting in comprehensibility of textbooks in high or low retention schools in all the districts except in Raigarh.

The teacher qualification in these districts is fairly satisfactory in all the districts but the situation with regard to their training needs looking into, and it may require some interventions to provide training courses in both pedagogy and tribal life and culture of the district.

As is known, the schools in tribal areas of Madhya Pradesh are administered by the Tribal Welfare Department, it might be considered prudent to integrate the expertise of the Tribal Welfare Department (specially the Tribal Research Institute and its sub centres) and DIETs to chalk out relevant and meaningful programmes.

Reasons for dropping out from the schools as stated by the children who have done so is predominantly illness which throws light on the state of affairs in health care programmes. School health programme are of immense importance and the DPEP districts in tribal areas would do well to promote programmes of school health in close collaboration with the medical department in concerned district. Looking after siblings — which is oft-repeated cause of most of the studies on tribal education — does not find enough support from the responses but it may be because of very small sample of the respondents. Relatively smaller portion of both boys and girls (except in Betul) want to return to school. It is still a matter of study as to why they do not want to return. The reasons need investigation in each specific tribal areas including the tribal ethnographic, demographic and economic profiles.

#### MAHARASHTRA

Only one district, viz., Nanded, has been covered in ST study and therefore our analysis is specific to this district only. For the parents' occupation as related to non-participation in schooling, although no P-value is significant yet it can be seen that all the parents of these occupation groups do not send their children even to Non Formal Education Centres. Preschool also does not attract enough of these parents. Almost exactly the same is the position when non-participation is viewed against family income groups except that the P-value is significant at 0.05 level for not sending the children to school by parents of below Rs. 500 p.m. family income and above Rs. 1000 p.m., family income (a lone respondent). None of these parents send their children to NFEC. Similarly, preschooling is also at a discount.

Significantly the VEC exists in Nanded and actively participates in educational programmes though there is scope for greater participation. However, it

## EFFECT OF HOUSEHOLD, COMMUNITY AND SCHOOL FACTORS

does not establish for certain that participation leads to high retention or low drop-out.

The mean score of incentives from high retention to developing retention are 2.37, 3.00, 3.00 which does not establish that incentives are causal factors for high retention in this district. The significant P-value at 0.01 level indicates that 100 per cent timely availability of the facilities is responsible for high retention. Preschool facilities do not seem to relate to retention.

Sickness and frequently travelling out of the village are the major reasons for leaving the school as stated by dropout boys and girls.

More boys want to return to schools than the girls.

### ORISSA

From the perusal of the table indicating the professions of parents who do not send their children, one finds that in Kalahandi, the participation rates in school or NFEC are lower than their counterpart in Rayagada among cultivators and manual workers. Although non-participation in NFE centres is almost equal in both these districts and that too in high magnitude. Similar situation is revealed when we look from family income perspective. Non-participation in any of the variables is conspicuous in indicating that these are hard core areas and calling for far more intensive and concerted efforts than at present. Once again tribal dialect not being used as medium of instruction stands out in both these districts. Participation in school function and non-enrolment proves to be statistically significant (with P-value at the level of 0.01) in Kalahandi. Similarly suitability of school timings and liking for the school system in Rayagada is statistically significant between "yes" and "no" response with P-value significant at 0.01 level and 0.05 levels respectively. Tribal dialect is again not a medium of instruction in district too. Community participation and retention do not show any relationship in both the districts.

The mean score of incentives available in Kalahandi are: 1.00 in high extension, 1.50 in medium retention and 1.00 in low retention, while it is 1.00, 3.00, 3.00 in Rayagada in that order showing the availability of number of incentives has little to do with retention. In Kalahandi non-availability of timely incentives with retention rate shows statistical significance at 0.05 level. Comprehensibility of the books stands out as a factor in all category of schools in both the districts with varying degrees in high, medium and low retention schools.

In Kalahandi moving out of village (immigration) turns out to be a significant factor for dropping out of the school with P-value significant at 0.01 level. One would recall that Kalahandi has been almost chronically draught afflicted area and tribal families moving out in search of food for survival has become a regular

feature. This is not so in Rayagada in that great measure, though it is worth taking note of. The boys and girls in both districts want to return to the school system.

TAMIL NADU

The non-participation in NFE programmes is total in Dharmapuri and almost total in Thiruvannamalai irrespective of the occupation groups. Same is true of preschool participation. On the factors of family income the picture is similar to that of occupation groups. Aspiration for higher education of children is conspicuously low in both the districts.

In Dharmapuri, those parents who do not send their children are not very familiar with the incentive schemes in both the districts. In Dharmapuri those who do not send children to school participate in school functions in considerable numbers.

Community participation and retention rates do not show conclusive relationship though some positive trend can be seen in Thiruvannamalai in contrast to Dharmapuri.

The incentive mean score in high retention, medium retention and low retention schools is 4.25, 4.64, 4.00 respectively in Dharmapuri, while it is 6.00, 3.4, 3.25 respectively in Thiruvannamalai and showing greater number of incentives available in this district in high retention schools. Retention rates do not reflect on curriculum, suitability of books, teacher qualification and training, etc., except the comprehension of book in Dharmapuri.

Illness is the only cause of dropout of boys in Dharmapuri signifying need for greater input in school health care programmes, while travel outside village is the single causal factor for boys in Thiruvannamalai.

In Dharmapuri majority of boys and girls do not want to return to school while it is opposite in Thiruvannamalai. This needs to be investigated as to what are the causes why Dharmapuri dropouts do not want to return — is it the content and transactional methods of education, or cultural apathy or anything else.

## ATTAINMENT OF ST CHILDREN

### I

The ST children's attainment is determined by many factors. In the following analysis we shall try to isolate such factors which either contribute to or impede the attainment of the ST child. These factors can be clubbed under broad heads such as household factors, community factors and school factors.

ASSAM

*Household Factors*

Of the cluster of household factors consisting of (a) Parents' education, (b) Fathers' occupation, (c) Mothers' occupation, (d) Help received from the family (in studies), and (e) Availability of sufficient food throughout the year. The achievement of the ST children have been examined against these parameters in each district of the states covered in the study. It may be mentioned that the data has been retrieved from the "Achievement Study". Therefore there is no opportunity to reframe the parameters.

In the district of Darrang, the data is available for only 37 ST students' achievement. It indicates that "parents' education" and "help received from the family" have significantly contributed to achievement in mathematics and language. The parents' occupation and availability of two square meals a day to the tribal students do not have any significant impact on the achievement. It may make us sit up and think. To me it seems that this may have implications for enrolment and retention but not for achievement. The means of significant factors goes on to substantiate that first generation learners' achievement is poorer than those in whose family the tradition of education is there. Same is true with regard to help received in matters of studies. In case of mathematics help has adversely affected achievement. This is mainly because the native mathematics and school mathematics have some fundamental differences. Ambasht (1994) examined the issue in the context of tribal societies and analyzed the factors of mathematical concepts in the context of tribal traditions.

"If we observe keenly the daily life of a tribal child in his work and play situation we shall find that he knows the concept of whole numbers, many a time, operates in systems other than decimal. For example, in some society, they count by fives or Gahi, which to a enlightened mathematician is nothing but number system to the base 5. In still some other societies, they count by scores (twenties) or Kudi, which again is the number system to the base 20. Various mathematical skills are in operation in the tribals, own world which has rationale as sound as ours. Should we insist that they learn our way from the very beginning? Is it possible for us to develop some methods and materials to perpetuate their system and at some later developmental stage inculcate the logic of decimal system? Not far ago in our mathematical history had we tried to introduce the binary approach (to the base 2) but ultimately we abandoned it as we could not adapt to a new system. Similar difficulty is felt by a tribal child when he starts operating in tens instead of his 'fives' or his 'twenties'. What can we do to let him



grow with the system and transfer to decimals in a smooth manner in course of time? These are some issues which we need to consider in the light of the cultural context of the tribe concerned."

This perhaps can explain the phenomena observed above.

The number of ST students in Dhubri district of Assam state is 22. There is no significant difference on any of the socio-economic factors on achievement in mathematics and language. The only factor that seems to play some role is "Fathers' occupation" with the language achievement of the child. The contact situation of tribals and non-tribals seems to be more pronounced in Dhubri district because of the district having predominantly non-tribal population, with only 2.24 per cent ST population. The language of the dominant culture and the language of the school are the same and in case of father being employed in the fields of non-tribals the interactive situation is in predominantly the dominant language. This perhaps could explain significant F-ratio in this case. In the district of Morigaon, the tribal population consists of 15.4 per cent and the total number of ST children covered in this study are 98. Like Darrang, the children of those parents who differ in their educational levels exhibit significant difference in the achievement of mathematics and language at 0.01 level. A peculiar trend which is visible is that the achievement trend in language is inversely related to the educational levels of parents, which is again substantiated by correlation coefficient. There is a mismatch in parental influence on language of pupil. This calls for a special consideration because it is contradictory to normal expectation to the general non-tribal setting. The factors that could be responsible for such a phenomena are : (a) the language acquisition for the tribal children is the acquisition of second language because the language of the school is different from the mother tongue of the child, (b) the more educated the parents are the greater is the consciousness about the need for strong mooring in the traditional society. Therefore the parents use the tribal language in all communicative processes within the family and the tribal community. Ambasht's study (1970) indicated that the traditional tribal looks at modern school education warily. He has the apprehension that exposure to education leads to deculturation. Therefore, there is a conscious effort on the part of the educated parents to stick to the tradition. The number of ST students in the district of Karbi Anglong covered in the "Achievement Study" is 156. It may be worthwhile to note that this district has 51.6 per cent tribal population and therefore is predominantly a tribal district. None of the F-ratio is significant on mathematics and language. So is the case with co-efficient of correlation.

### *School Factors*

The following factors have been considered as school factors which might affect

the achievement of the ST children in mathematics and language : (a) provision of midday meal; (b) whether the child is a grade repeater; (c) teacher attendance; (d) mathematics problem given; (e) home assignment (teacher gives home work); (f) teacher correcting home work; (g) knowledge of result provided (feedback on the home work and class assignment); (h) reading of other books; and (i) reading newspaper.

In the district of Darrang, 38 ST children have been covered under the study. Only two factors, viz., "teacher's attendance" in school and "teacher correcting homework" have significance for mathematics achievement at 0.01 level. There is a significant correlation between home assignment and achievement in mathematics. The same is true in case of achievement in language. Two factors emerge as very important, especially in the tribal context, "regular attendance of teacher" and "correcting the home assignments". In Dhubri district the number of students covered is 22. No significant difference is found in the achievement of mathematics or of language by any of the factors, enumerated above. In the district of Morigaon the number of students covered is 98. Reading of other books makes significant difference in mathematics achievement at 0.05 level. That means that who could take a recourse to other supplementary material or books could achieve better. In case of language achievement the trend is similar to that of Darrang. The analysis of the mean score shows that the performance of those who "never" get feedback is far better, followed by those who get feedback "sometimes" and those who "always" get the feedback. It is the least in those cases where it is "not applicable". It is a matter of common knowledge that the tribal children get into the world of work rather early in their life and thus have ample opportunities of interacting with others through language. In the district of Karbi Anglong, the number of children covered are 156. Five factors are found to be significant in F-ratio in relation to mathematics achievement. They are: mathematics problem given; knowledge of result provided; teacher correcting homework; teacher giving homework; and reading other books, in that order. On the factor, "mathematics problem given" the F-ratio is significant at 0.01 level and the mean score suggests that those who get mathematics problem "everyday" have fared significantly better than those who "sometimes" get mathematics problem. Similarly the factor "knowledge of result" provided is significant at 0.01 level. The mean score suggests that those who "always" get feedback have achieved significantly better than those who "never" get feedback followed by those who get feedback "sometimes". Again, "teacher correcting homework" is found to be significant at 0.01 level. Similarly those who get homework "regularly" perform better than who "never" get homework or those who get it "sometimes". "Reading of other books" makes significant difference on achievement in mathematics as compared to those who do not read other books. The coefficient

correlation shows that all the above factors are significant between 0.001 level and 0.01 level and are positively correlated. In matter of language achievement three factors have been found to be significant on F-ratio. These are: teacher attendance, teacher giving home work and reading of other books at 0.05, 0.05 and 0.01 levels respectively. The mean scores suggest that teacher's regular attendance makes positive contribution to the achievement of the pupil. Similar is the trend when teacher gives home work. And so is the case with reading other books.

#### KARNATAKA

In Karnataka, Kolar is the only district where viable sample has been covered, with 96 ST students.

##### *Household Factors*

No variable shows significant difference on F-ratio on mathematics achievement, but on language achievement, it is significant for the variable "Academic help from the family" which is significant at 0.05 level with those who receive help achieving higher than those who do not and in whose case this is not applicable, in that order. No coefficient of correlation is significant for language achievement or mathematics achievement.

The numbers of ST students covered in this district are 70. None of the factors show any significant F-ratio either on mathematics achievement or on language achievement. None of the coefficient of correlation is significant either.

##### *School Factors*

No factor shows any significant difference on F-ratio on mathematics or language achievement except for the factor "reading newspaper" on language achievement which is significant at 0.01 level and those who do not read newspapers perform better than those who do but it can be disregarded as there is only one case which reads a newspaper as compared to 95 who do not. No coefficient of correlation is found to be significant.

Same is the position with school factors for F-ratio and coefficient of correlation.

#### KERALA

Because of insufficient ST sample we have not analysed the data from any district other than Wynad in Kerala.

### *Household Factors*

The number of ST students covered by the Achievement Study is 170. The F-ratio of "parents education" is significant at 0.05 level on mathematics achievement with children of educated parents achieving better than those of the illiterate parents. Same is the case with respect to language achievement where F-ratio is significant at 0.01 level with respect to language achievement. All other factors do not show any significant F-ratio or coefficient of correlation either on mathematics or language achievement.

### *School Factors*

None of the school factors show any significant 'F' ratio or coefficient of correlation either on mathematics or language achievements.

### *MADHYA PRADESH*

### *Household Factors*

In Betul district, 79 students have been covered under achievement study and it is presumed that most of them would be Gonds. In mathematics achievement only two F-ratios are found to be significant, which are "father's occupation", and "help from and family". The significant F-ratios are corroborated by their corresponding coefficient of correlation. The other factor "help from family" is also found to be significant at 0.01 level, meaning thereby that those who receive help perform better than those who do not. Again two significant F-ratios are "father's occupation" and "help from family", the former at 0.01 level and the latter at 0.05 level. Those whose parents are in other occupations have better achievement in language. Similarly those who get help from family also perform better. The coefficient of correlation is significant at 0.01 level in case of father's occupation. In Dhar, it is found that on mathematics achievement F-ratio is significant at 0.01 level for "availability of food" showing that those who "never" get sufficient food show better achievement than those who get it "regularly" or who get it "sometimes". Perhaps, deprivation leads to greater urge to improve one's own lot. Guna, Mandsaur, Raisen, Satnaand, Chhatarpur have too small sample for any meaningful analysis and therefore it has been left out ( $N < 30$ ). In Rajgarh, the total number of ST students is 65. None of the F-ratio or coefficient of correlation is significant, either on mathematics achievement or language achievement. In Raikam the number of ST students covered is 35. None of the F-ratios is found to be significant on mathematics. On language, none of the F-ratios is significant except for the factor availability of adequate food at

0.05 level with those who never have sufficient food achieving better than those who have it sometimes, followed by those who have it always. No coefficient of correlation is significant either for mathematics or for language achievement. In Sihore district we have  $N=51$ . None of the F-ratios or coefficients of correlation is significant either for mathematics achievement or for language achievement. In Panna district we have 41 ST students. None of the factors have significant difference on mathematics achievement while "Parents education" makes significant difference at 0.05 level on better achievement of their children than the illiterate parents. None of the coefficients of correlation is significant. The district of Rewa had sample size of 50. None of the F-ratios were found to be significant on any of the factors on Mathematics achievement. So is the case with coefficient of correlation. In matters of achievement in language the level of significance of factor "help from family" is 0.01 and "availability of sufficient food" is 0.05; the first in favour of those who do not get help and the second in favour of those who get adequate food sometimes followed by those who get it always and who never get it, in that order. The coefficient of correlation is significant only in case of help received from the family. In Sidhi district the  $N$  is 69 but no F-ratio or coefficients of correlation is significant either on mathematics or language achievements. In Bilaspur ( $N=108$ ) none of the F-ratios is significant on achievement of mathematics. Same is true for coefficient of correlation. On achievement of language, the significant factor is availability of sufficient food (0.05 level) with those who never have sufficient food achieving better than those who always have it followed by those who sometimes have it, in that order. In Rajgarh district 99 ST students who were covered by the Achievement Study, none of the F-ratios is significant, while only "parents educational status" is found to be significant at 0.05 level on the language achievement. An analysis of their corresponding means indicate that the children of college level educated parents achieve better followed by illiterate parents and parents educated up to secondary school, in that order. In Rajnandgaon, there are 71 ST children covered. The only significant F-ratio is "father's occupation" on mathematics achievement, which is significant at 0.05 level. The study of means indicate that children of "unskilled agricultural workers" perform better followed by those in "other occupation" and "farmer" in that order. No factor has significance on language achievement. In Surguja there are 104 ST students covered. No factor has been found to have any significant F-ratio in mathematics and language except "father's occupation" on language at 0.05 level. The study of means indicate slightly different situation than in Rajnandgaon district because here the children of parents engaged in "other occupation" perform better than those of the "farmers" and "agricultural unskilled workers". In Shahdol, the number of ST students covered is 144. No F-ratio or any coefficient correlation is significant on mathematics achievement.

On language achievement the factor "mother's occupation" shows significance at the level of 0.05 with children of mother's engaged in "cultivation" showing better achievement followed by those of "housewives" and of "agriculture unskilled labour", in that order.

### *School Factors*

In Betul, the factor "midday meal" has a significant F-ratio on achievement of mathematics at 0.01 level. The study of means indicates that where no midday meal scheme exist and achievement is higher followed by where the children are not getting and where they are getting and the children are satisfied, in that order. The factors of "knowledge of result provided", "teacher correcting homework" and "teacher giving homework" have significant F-ratio at 0.01 level each while "reading newspaper" has significance at 0.05 level on language achievement. The children perform better where "knowledge of result provided" is "always" followed by "never" and "sometimes", in that order. Similarly those children whose homework is corrected "always" achieve better followed by those whose homework is "sometimes" corrected followed by those places where this factor is "not applicable" in that order. "Teacher giving homework" regularly leads to better achievement than "sometimes homework" or "never homework" in that order. Again, "reading of newspaper" makes a positive difference in language achievement. It is revealed that there is no significant coefficient of correlation in mathematics achievement, while in language achievement, "knowledge of result provided" has significant correlation at 0.01 level and "teacher gives homework" is again negatively correlated at 0.001 level. In the district of Dhar, the factor of "repeater" shows significant F-ratio on mathematics achievement at 0.05 level and "mathematics problem given" at 0.01 level. The study of mean shows better performance in case of those who are "not repeating" than those who are "repeating". Those who are given mathematics problem everyday perform better than those who are "never" given followed by those who are "sometimes" given. The coefficient of correlation is not significant on mathematics achievement rate. Neither is it significant in case of language achievement. However, the F-ratio is significant in case of language achievement, for the factor "teacher attendance" at 0.05 level with teacher attending "sometimes" giving better performance than those attending "everyday" or "most days". This is very peculiar because teacher input in case of language achievement of children can be questioned! Specially the teacher himself is tribal and language tested is the regional language. It needs further probing. In Rajgarh the F-ratio of two factors are found to be significant on mathematics achievement at 0.01 level each and they are "repeater" and "teacher attendance". The study of mean in case of repeater reveals that those who are "repeating" achieve better than those who are "not repeating". Unlike

Dhar, "teacher regular attendance" leads to better achievement followed by "most days" and "sometimes". The coefficient of correlation is not significant in any of these factors. In case of achievement in the language, the F-ratio is significant for the factor "repeater" and once again the "repeaters" perform better than the "non-repeaters". No other F-ratio is significant as also none of the co-efficient of correlation.

In Ratlam the study of F-ratio on mathematics achievement shows that it is significant for the factor "teacher gives homework" at 0.01 level with "regular" homework achieving better results than "sometimes homework" the coefficient of correlation on mathematics achievement is significant for two factor — "teacher attendance" and "mathematics problem" given at 0.01 and 0.001 levels respectively. The F-ratio for language achievement shows significance at 0.05 level for "midday meal" with the group not applicable "comes achieving higher than where it is available and satisfied. In Sihore district, the factor "teacher attendance", "teacher correcting home work" and "reading other books" have significant F-ratio at 0.05 levels each. While teacher gives homework is significant at 0.01 level. The study of mean shows that achievement of children in mathematics is better where the teacher attends school "most days" as compared to where he attends "everyday". For the "teacher correcting homework", the mean reflects that the group of responses of "non-applicable" achieve most followed by those of "sometimes", "always" and "never" in that order. For "teacher giving homework" the mean reflects that those who are "never given homework" score higher than those who get "sometimes" and "regularly", in that order. Those who "read other books" achieve better than those who do not. In language achievement, the F-ratio of factors "knowledge of result provided" and "reading other books" are significant at 0.05 and 0.01 levels respectively. Those whose results are "never" provided perform better than who are "always" provided followed by whose results are "sometimes" provided. This indicates that tests are not in the nature of diagnostic and remedial, which is the crux of unit tests. "Reading other books" leads to better achievement than not reading other books. The coefficient of correlation in case of mathematics achievement is significant at 0.01 level for the factor "teacher gives homework". In case of achievement in language, coefficient of correlation is significant at 0.01 level for "reading other books". It may however be noted, that Sihore is a district adjacent to the capital Bhopal and the characteristic of secludedness of the tribals is not an attribute of these people. Therefore, exposure to reading material other than the textual is presumably better. In Panna, none of the factors is significant except "teacher giving homework" on mathematics achievement. Those who are given homework "regularly" achieve better than those who are given "sometimes" or "never", in that order. The coefficient of correlation in mathematics is not significant for any of the factors so is the case in language for F-ratio and

coefficient of correlations. Almost similar is the case of Rewa to that of Panna, except that the only significant F-ratio is seen at 0.05 level on language achievement for the factor "teacher correcting homework" with those whose homework are "never" corrected performing best, followed by "always", "sometimes", "not applicable" groups. One would wonder that those whose work are "never" corrected are achieving better! It might call for deeper probe. In the district of Sidhi none of the F-ratio, either on mathematics achievement or on language achievement, is significant so is the case for coefficient of correlation. The district of Bilaspur shows significant F-ratio on mathematics achievement for the factor "teacher corrects homework" at 0.01 level. The study of mean reveals that those whose homework is corrected "sometimes" achieve higher than those whose homework is corrected "always" or "never", in that order. But "teacher gives homework" has significance of F-ratio at 0.05 level with highest achievement of those who get it "regularly" followed by those who get it "sometimes" or "never". Thus it is revealed that homework provides practice in mathematics and practice is more important for better achievement. None of the coefficients of correlation is significant on mathematics achievement. In matter of language achievement it is noticed that F-ratio of "knowledge of result provided" is significant at 0.05 level, with those achieving better whose results are sometimes provided, followed by those who are always provided, and never provided, in that order. Like mathematics none of the variables show any significance in coefficient of correlation. In Raigarh district, on mathematics achievement the factors of "mid-day meal" and "mathematics problem given" have significant F-ratio at 0.05 level each; and "reading other books" and "teacher corrects homework" are significant at 0.01 levels each. The study of mean for mid-day meal reveals that "not applicable" group performs best followed by "not getting" and "available" groups. Similarly for "teacher correcting homework", "sometimes" group performs better than "always" group. In case of mathematics problem given, "sometimes" group perform better than "everyday" group; those who read other books do better than those who do not on mathematics achievement. The coefficient of correlation of mathematics achievement is significant at 0.01 level with the variable "mathematics problem given". Same is true for variable "reading other books". On the language achievement the only significant F-ratio is "reading of other books" at 0.05 level with those reading it achieving better than those who do not. The coefficient of correlation is not significant on language achievement. In Rajnandgaon, the only F-ratio showing significance in this district is the variable of mid-day meal at 0.05 level on mathematics achievement, with those to whom it is "available and their being satisfied" performing better followed by the "non applicable" and "not getting" in that order. No coefficient of correlation with mathematics achievement is found significant F-ratio on language achievement or coefficient of correlation



with the language achievement is found to be significant. In the district of Surguja, on mathematics achievement the variables of "reading other books" and "reading newspaper" show significant difference at 0.05 levels while the variables "teacher corrects homework" and "teacher gives homework" shows significant difference at 0.01 level. Those who read other books and newspapers achieve better than those who do not. Those who get home work regularly achieve better than who get "sometimes" or "never" in that order. Those whose homework is corrected "always" perform better than those whose homework is corrected "sometimes", "not applicable" or "never" in that order. None of the coefficient of correlation is significant on mathematics achievement. On language achievement the F-ratio that are significant at 0.01 level are for variables "mid-day meal", "reading of the books" and "reading newspapers" with "mid-day meal not getting" group achieving better than "not available" group, and those "reading other books" and "reading newspapers" performing better than those who do not. The F-ratio on language achievement at 0.01 level of significance are variables "teacher attendance" and "teacher corrects homework". The mean shows that where teacher attends "most days", children achieve better, than when he attends "sometimes" or "everyday". For the other variable "correcting homework" the order of achievement goes down from getting homework "always" to "sometimes" to "not applicable" to "never". The coefficient of correlation is significant at 0.01 level on language achievement with the variable of teacher attendance. In Shahdol, on the achievement of language, the F-ratio of "knowledge of result provided" and "teacher gives homework" are found to be significant at 0.05 level each while the variables "teacher corrects homework", "reading other books", "reading newspapers" are significant at 0.01 level each. The achievement goes down as one descends from "knowledge of result provided" from "always" to "sometimes" to "never". Similar is the trend in case of homework being given "regularly", "sometimes" and "never". Teacher correcting homework "always" leads to better achievement in mathematics, followed by "never", "sometimes" and "not applicable" groups, in that order. Reading of other books and also newspaper leads to better achievement than not reading them. The variable of "knowledge of result provided" is correlated with mathematics achievement in ST. In the case of language achievement F-ratio is found to be significant for the variable "mid-day meal" at 0.05 level and "teacher correcting homework" and "teacher giving homework" at 0.01 levels each. Those who get midday meal show better achievement followed by those "who do not" and "not applicable" groups. Correction of homework "always", "never", sometimes" and "not applicable" are the order of achievement in language. Similarly, "regular" home assignments, "sometimes" home assignments and "never" home assignments achieve in that descending order in language.

## MAHARASHTRA

*Household Factors*

In Aurangabad district none of the F-ratios is significant, except on the factor "help received from the family" on mathematics achievement at 0.05 level. The study of mean shows that "help received from parents" have not led to better achievement, rather it is the opposite. This trend is seen in language too. The coefficient of correlation is not significant on either mathematics or language achievement. In the district of Nanded, it is found that none of the F-ratio is significant on mathematics achievement. So also the co-efficient of correlation. F-ratio of language achievement is significant on the factors of 'mothers' occupation' and 'availability of food' at 0.01 levels. The analysis of means reveals that the children of such mothers who are engaged in cultivation perform better. A strange phenomena is noticed when those children who 'never' have sufficient food perform better followed by who 'always' get sufficient food and who get 'sometimes,' in that order. The only reason appears to be responsible for such a situation is perhaps the poorer groups have stronger motivation for education and they perform better. However a detailed study might be necessary for investigating such a phenomena. In the district of Parbhani it is found that none of the F-ratio is significant on mathematics achievement except 'parents education' at 0.01 level of significance. The study of means indicates that, achievement goes on increasing in direct proportion to the level of parents education. The co-efficient of correlation also shows the same significance. In the case of language achievement, 'mother's occupation' is significantly related with the achievement at 0.01 level. The study of means reveals that children whose mothers are housewives perform better than those whose mothers are engaged in cultivation, agriculture and unskilled works, in that order. The co-efficient of correlation is also significant at 0.01 level.

*School Factors*

In the district of Aurangabad none of the school factors excepting 'Teacher gives homework' shows a significant F-ratio at 0.01 level, on mathematics achievement. The study of means indicates that "regular" homework leads to better achievement. The coefficient of correlations are not significant. The situation in Nanded is slightly different. On mathematics achievement, "knowledge of the result provided" and "teacher correcting homework" and "teacher giving homework" show significant at 0.01 levels. The analysis of mean scores shows that the children who get the feedback "sometimes" have achieved highest followed by those with "not applicable" who "always" got feedback and those who "never"

got feedback. The factor of teacher corrects homework, though is significant at 0.01 level yet the number of respondents under "not applicable" is only one compared with 21 children, may be misleading. The comparison of mean score may give us some indication as those whose homework is always corrected have achieved better. The F-ratio obtained for "teacher gives homework" is again significant at 0.01 level. The mean scores indicate that those children have achieved most who get homework "regularly" in mathematics followed by those who "sometimes" and those who "never" get. The F-ratio on language achievement shows that four factors have significant F-ratio. They are "knowledge of result provided"; "teacher corrects homework"; "teacher gives homework" and pupil "reads newspaper". The children who get feedback from their teachers differ from those who do not get feedback at 0.01 level of significance. In their language achievement, the study of means shows that those who get feedback "sometimes" achieve better followed by those who "always" get feedback followed by the "not applicable" cases (where homework is not given) followed by those who "do not" get feedback. The F-ratio of the factor "teacher corrects homeworks" is again significant at 0.01 level meaning thereby that pupil who get feedback "always", "sometimes", "never" and "not applicable" differ significantly in language achievement in that order. Similar trend is noticeable on the factor "teacher gives homework". The analysis of mean scores in this case shows that pupil should get homework regularly in language to achieve significantly better than who "never" get homework followed by those who get homework "sometimes". The F-ratio with regard to "reading of newspaper" is significant at 0.05 level for achievement in language. If we look at the mean scores we find that those who do not read newspaper have better achievement than those who do. The explanation for such a lop-sided picture is perhaps revealed by imbalances of the number of children who read newspaper and who do not. The coefficient of correlation on mathematics achievement is not significant except on one factor where the "teacher gives homework". It is found to be significantly correlated with mathematics achievement. In case of language achievement, coefficient of correlation are significant for "knowledge of result provided" at 0.05 level and "teacher corrects homework" at 0.01 level. In matter of language achievement, the coefficient of correlation are significant for "knowledge of result provided"; "teacher corrects homework" and "teacher gives homework" at 0.05 level, 0.01 level, 0.001 level respectively. It means that all three factors are significantly related to the language achievement. In the district of Parbhani none of the F-ratios or for that matter coefficients of correlation is significant on either language or mathematics achievement.

## ORISSA

*Household Factors*

None of the F-ratios is significant in Kalahandi. The correlation coefficient also indicates that none of the factors is significantly related with mathematics and language achievement. In Gajapati, we do not have any percentage of ST population in the study. The household factors are the same. The only significant factor is "parents education" affecting mathematics achievement (at 0.05 level) of the ST students. A look at the mean scores indicates that it goes on increasing with the level of parents' education. No correlation with the achievement in language and mathematics is found to be significant; at the same time the factors of "help received from family" and "availability of food" are correlated with the achievements in mathematics language, though not at significant level none of the F-ratio is significant on mathematics achievement. In language achievement the factor "mothers occupation" and "availability of food" show significant differences. The mean scores of language achievement indicate that those children, whose mothers are housewives, have achieved far better followed by those children whose mothers are engaged in cultivation and are working as agricultural and unskilled labourers. "Availability of food" leads to better achievement, in language. The coefficient correlation, on mathematics achievement, is not significant but in language achievement, "mother's occupation" is a significant factor. One can say with certain degree of confidence, that mother's occupation contribute significantly towards language achievement. Rayagada, is also a new district and the ethnographic detail with regard to the district are not available for reasons stated in case of Gajapati. The number of ST children is 26 under this study in this district. None of the F-ratios is significant, meaning thereby that the children grouped on different factors, do not differ significantly on their achievement on mathematics and languages. As regards correlation coefficient too, none of the factors is significantly related to the achievement in mathematics or language. But one point is noticeable. That availability of food is correlated with mathematics achievement.

*School Factors*

The school factors having bearing on achievement, in mathematics and language, in Gajapati reveal that but for "repeater" factor, none other factor is significant (in mathematics) as far as F-ratio is concerned. The factor "repeater" is significant at 0.05 level which means, that those ST pupil who have repeated grades have significantly differed from those who have not, the latter having higher mean. It is a matter of concern that "repeater" as a factor should not have existed if

the state has no detention policy. It may be worthwhile to point out that perhaps those grouped as repeater are those who dropped out and joined again in the same class. Similarly, the F-ratio of "midday meal" is significantly related to language achievement at 0.01 level. Provision of mid-day meal has certainly made a impact on achievement in language as is revealed by the study of mean score. None of the factors is significantly correlated where coefficient of correlation is considered. In the district of Kalahandi under the school factors, none of the factors is significant on mathematics and language achievement. Same is true for coefficient correlation. In the district of Phulbani, the position is similar to that of Kalahandi as far as achievement in mathematics is concerned. But in case of achievement in language, three F-ratios are found to be significant at 0.01, 0.05 and 0.05 levels and they are "knowledge of results provided", "teacher corrects homework" and "teacher gives homework" respectively. The study of means, reveal that the achievement is directly related to the factor of "knowledge of result provided". Similarly, the perusal of the mean shows that better achievement is indicated from those students whose home work is correlated, "always", "sometimes", "never", in that order. Similar trend is noticeable from the study of mean, for the factor "teacher gives homework". This shows that homework plays an important role in the achievement of language skills; none of the coefficients of correlation is significant in mathematics and language except the "knowledge of result provided" in case of language. In the district of Rayagada, the analysis reveals that, on mathematics achievement none of the F-ratios is found to be significant except the factor "reading other books". The analysis of mean scores shows that those who "read other books" perform better. In matters of language achievement none of the F-ratios is significant except on the factor "repeater". The study of mean score indicates that the "repeaters" achievement is poorer than others. The coefficient of correlation on both mathematics and language achievement shows no significant correlation except the factor "reading other book" on achievement in mathematics at 0.01 level, which means reading other books is related to better achievement in mathematics.

#### TAMIL NADU

Tamil Nadu has three DPEP districts, namely Dharmapuri, Thiruvannamalai and South Arcot. The tribal students under the Baseline Achievement covered in Thiruvannamalai has insignificant sample, so we shall not be considering this district for our analysis purposes.

#### *Household Factors*

In Dharmapuri, mother's occupation is significant at 0.05 level with the children

whose mothers are "housewives", achieving most in mathematics followed by those whose mothers who are in "cultivation" or "agricultural unskilled" occupation. The coefficient of correlation for the factor "mother's occupation" is negative and is significant at 0.01 level. The variable "mother's occupation" shows significant F-ratio at 0.01 level with children of "housewife", "cultivator" and "agricultural and unskilled" labourer in descending order. The coefficient correlation with this variable is negative and is significant of 0.001 level. Another variable that shows significant difference at 0.05 level, on language achievement is "academic help received from the family" with "no help received" group achieving better than the one that "received help". The perusal of the achievement in South Arcot district does not exhibit any significant correlation either in mathematics or language.

### *School Factors*

In the district of Dharmapuri a look at the variable showing school factors related to achievement, we find only one ratio which is significant at 0.01 level on mathematics achievement. The factor is "teacher gives homework" with those who "never get homework" achieving better than those who get "regularly" followed by those who get "sometimes". No variable gives significant coefficient correlation with mathematics achievement. On language achievement too, the F-ratio is similar in case of teacher gives homework at 0.01 level of significance and the means exhibit a similar achievement as in mathematics. In South Arcot, there is no variable or coefficient of correlation which shows any significant difference.

## II

### ASSAM

There is no significant difference in achievement of boys and girls either in mathematics or in language in any of the districts of Assam except in case of language in the district of Karbi Anglong where it is significant at 0.01 level. When we further probe into high and low achievement we find that the F-ratio for mathematics achievement in Darrang district is significant at 0.05 level, and for the rest no significant difference is found. The achievement of boys and girls show significant difference on F-ratio at 0.05 level for the factor "academic help received" with boys getting more help than the girls. One would, therefore, be inclined to think that there is a familial concern for boys to achieve better than the girls. One could safely say that the education of the boys are at a premium as compared to that of the girls in this. None of the school factors is found to have any significant P-values while one of the household factors, has seen one

variable "availability of food" as a significantly associated variable with gender at 0.05 level. Further, an analysis of all frequencies indicate that a majority of the girls get food "always" compared to boys, a majority of boys get "sometimes", as compared to girls and a majority of the boys "never" get food as compared to girls. If we look at the social organisation of tribal societies, we would notice that girls have certain social appreciation and they are prized. So this trend is not illogical as would usually appear to a non-tribal mind. In the district of Morigaon only one variable "homework given" is found to be significantly associated with gender at 0.01 level. Further, a majority of girls "sometimes" get homework while a majority of boys "never" get homework. In the district of Karbi Anglong, on two variables p-value is found to be significant. They include "parents' education" and "availability of food" at 0.05 level on both. It means the gender is significantly associated with the above two variables. On parents' education, a majority of boys have their parents as illiterates while it is fifty-fifty at higher secondary level. On availability of food 52.0 per cent of boys have "always" got sufficient food compared to 48 per cent girls; a majority of boys (83.3 per cent got "sometimes" compared to 16.7 per cent girls in that category and those who "never" got sufficient food, 66.7 per cent are boys compared to 33.3 per cent girls. If we calculate this within each gender, we find that out of total boys about 72 per cent get sufficient food "always" as against 76.6 per cent girls. Similarly, 16.8 per cent boys get sufficient food "sometimes" compared to 3.8 per cent girls and 11.2 per cent boys "never" get sufficient food as compared to 6.5 per cent girls

#### KARNATAKA

None of the F-ratio is found to be significant on mathematics and language achievement and gender of the learner. The P-values on level of achievement and gender of learners are also not significant, in either of the subjects. The household and school factors do not have any significant P-value in Kolar district. The position in Raichur is similar to Kolar with respect to household and school factors.

#### KERALA

In Kerala the F-ratio is significant at 0.01 level in case of mathematics achievement of boys and girls with boys scoring higher than the girls. However, none of the P-values for high or low achievement of boys and girls is found to be significant. Similar is the position with regard to achievement of the boys and girls, with respect to household and school factor in Wynad district in Kerala.

## MADHYA PRADESH

The district-wise achievement of boys and girls on mathematics and language shows that significant F-ratio occur in Panna district (.001 level), Rajnandgaon (0.01 level) and Shahdol (0.01 level). Boys perform better than girls in Panna, they again perform better in language in Rajnandgaon. But in Shahdol, it is mathematics in which boys achieve better than the girls. The gender and levels of achievement in mathematics and language have not found to be significantly associated in any of the districts of Madhya Pradesh. In Dhar district, the gender is significantly associated with the "availability of food". A majority of the boys are on the "always" category and on "sometimes" category but a majority of girls are on the "never" category. In Ratlam district, the gender is found to be significantly associated with "homework correction" at 0.05 level. Further, an analysis on frequencies/percentages indicate that a majority of boys "always" get their homework corrected while a majority of girls "sometimes" get their homework corrected. In Sidhi, the gender is significantly associated with availability of food. Further, a majority of boys "always" get and a majority of girls "sometimes" get, and in "never" category only one girl is seen. On parents' education too, the gender is found to be significantly associated. Further, a majority of the illiterate parents are of boys while a majority of the higher secondary educated parents are of girls. In Bilaspur too variables are significantly associated with gender. They include, "academic help received from family" and "grade repetition" at 0.05 and 0.01 levels. On "academic help received from the family" the percentage indicates that a majority of the boys received help and a majority of girls do not receive help. On the variable "grade repetition" the percentage of boys and girls suggest that a majority of girls are non-repeaters and a majority of boys are repeaters. In Rajgarh four of the P-values are significant. They include "academic help received from the family", "grade repeater", "homework given" and "reading other books" with 0.05, 0.05, 0.05 and 0.01 levels, respectively. On variable, "academic help from family" a majority of the girls have received help while a majority of the boys have received no help. On variable "grade repetition", it is evident that a majority of girls are non-repeater while, a majority of boys are repeaters. On variable "homework given", a majority of boys "regularly get homework" while a majority of girls get "sometimes". On 'never' category all (100 per cent) are girls. In Rajnandgaon only one value is significant at 0.05 level, i.e., "reading other books". It means, this variable is significantly associated with gender. Further, a majority of boys "read other books" while a majority of girls "do not read other books".



## MAHARASHTRA

District-wise achievement of boys and girls on mathematics and language indicates that none of the F-ratio is significant except of language achievement of boys and girls of district Nanded, at 0.001 level. It means, that the boys and girls differ significantly on their language achievement in favour of boys. None of the P-values is significant. It means the levels of achievement of mathematics and language is not significantly associated with gender of any of the districts of Maharashtra. In district Parbhani two variables are significantly associated with gender. They include "academic help received from the family" and "reading other books" at 0.05 and 0.01 levels respectively. On academic help received from family, the percentage indicates that a majority of girls receive help while a majority of boys receive no help. On reading other books, 100 per cent of girls read while a majority of boys do not.

## ORISSA

The analysis indicates that only one of the F-ratio is found to be highly significant at 0.001 level, of district Gajapati on language. It means, boys and girls of Gajapati district differ significantly on language achievement in favour of girls. The analysis indicates that only one P-value is further found to be significant at 0.01 of district Gajapati on language. It means, the levels of achievement is found to be significantly associated with gender on language. Further, a majority of boys are seen as low level and the same is seen among girls too. Only two P values are found to be significant at 0.01 levels. They include "academic help from family" and "reading other books." On "academic help from the family", a majority of girls receive help while a majority of boys do not receive help. On "reading other books", it is evident that a majority of girls read other books while a majority of boys read no other books. In Phulbani district only one P-value is found to be significant on "parents' education". Further, a majority of boys have their parents who are illiterate and educated up to higher secondary levels while college level educated parents are seen only one of girls. Rayagada has two significant P-values at 0.05 level. They include "availability of food" and "reading other books".

On variable, "availability of food", a majority of boys "always" get food, and a majority of girls "sometimes" and "never"; get food. Compare this with Karbi Anglong in Assam. The general poverty of the district may perhaps explain this in spite of girls being at a premium than boys in the tribal societies. Ambasht (1993) has dealt with female gender preferences in greater details and established that tribal women have greater social values than their non-tribal counterparts.

On "reading other books" a majority of girls do read other books while a majority of boys do not.

## Conclusions

### 1. ENROLMENT

(i) High attendance as reported in Assam tribal sample is mainly because high attendance entitles the students and thereby the school to receive the attendance scholarships.

(ii) In Assam community participation in school functioning seems to have some correlation with higher enrolment, but this is belied in some other states.

(iii) The common significant finding is that decentralized curriculum is not in vogue in almost all the tribal areas.

(iv) The need of the extension of preschool facilities is felt in most of the places but a note of caution is required as to the content and approach of the preschool programme. It needs to be reoriented in the light of the specific socio-economic and cultural requirement of the particular tribal community.

(v) Village Education Committees have not been actively participating in the affairs of the schools in most of the areas. It would be fair to expect that with the establishment/constitution of the Panchayats under the new Constitutional provisions these would become effective, but it would be desirable to chalk out the roles and functions of these Village Education Committees in a manner that suitable accountability of the education functionaries is inbuilt.

(vi) Books have to be rewritten afresh because the suitability of the textbooks is an important issue and is linked with the medium of instruction and success of primary education.

(vii) Supervision of the schools have to be reoriented to make it really effective. The nature of the supervision in these areas have to change from inspection mode to supervision mode in right spirit.

(viii) One significant feature that emerges from the data is that quite a few tribal communities, specially who have been in greater contact situations with the non-tribal communities, have shown interest in higher education of their children as motivation exists in such situation, but may be the means do not permit.

(ix) Teacher truancy in many cases have been found to be more mythical than real. Specially in cases of the communities that have fallen in our sample. But this may not be true of all the tribal areas because there are other researches that have shown to the contrary.

(x) The strategies for implementing NFE scheme evolved by different states leaves much to be desired in the case of ST community.

(xi) The need to create an awareness of the various incentive schemes

available in different tribal areas to arouse the mass consciousness and create a pressure on the government to make them available in time is very much needed.

(xii) It is emerging from many areas that the community participation is not related to the enrolment.

(xiii) Teacher training is brought out by the present data available with us hardly gives us any clue with regard to the content having anything of the tribal life and culture. But it appears that it takes only the pre-service pedagogic training into account.

(xiv) The degree of contact situation of tribe with the dominant community also conditions its psyche due to various acculturative processes that are at work all the time. Therefore, one would find scenarios which are quite different in case of the tribes like the Naikda and the Paniyan, the Gonds and the Bhils, the Miris and the Maratis, and yet one could fall prey to temptation of clubbing them as tribals and try to prescribe one single package of intervention strategies branded as suitable for the tribal needs.

(xv) The need for the DPEP to reorient itself in case of the tribal situation is to make itself a Tribe Specific Primary Education Program (we have purposefully refrained from naming it as a tribal primary education programme) in such areas instead of the district as a unit of planning.

## 2. RETENTION

(i) Retention is closely linked to the enrolment and many factors that have emerged call for interventions to increase the holding power of the school or of the non-formal education system. While talking to such parents whose children have dropped out of the school system it emerged that some parents do not want higher education for their children because the education that we provide to these children in the schools alienate them from their own cultural moorings. There is need to decentralize educational curriculum planning and material development, not at the district level but at the tribal level.

(ii) The suitability of school timings and retention needs further probe and in a more scientific manner. As of now, from the data available, it is rather difficult to say that it has some relationship. At the same time it is a matter of common knowledge that it was a significant factor which led to the launching of the NFE Scheme, at hours convenient to the out-of-school children.

(iii) There are some peculiar factors that emerge in Assam. The girls do not drop out because of looking after the siblings or because of the economic factors.

(iv) The medium of instruction remaining the state language specially at the initial levels of primary schools, could be a factor of dropout from the school.

(v) There is a definite case for launching the awareness campaign about the

## EFFECT OF HOUSEHOLD, COMMUNITY AND SCHOOL FACTORS

incentive schemes specially among those parents whose children are not going to the school system.

(vi) The need of developing a positive attitude towards tribal way of life among the teachers is the need of the hour.

(vii) School health programme in tribal area may be of great help in reducing dropout on account of illness as it turns out to be a major reason for dropout.

(viii) Further investigations are required to find out the reasons for the dropout children not wanting to come back to the school system.

(ix) It also emerges that absence of preschool facilities and dropout have some kind of relationship. The extension of preschools with specific tribal orientation emerges to be a prime need.

(x) NFE schemes need to be extended in the tribal areas but they have to be oriented to the specific educational and cultural needs of the particular tribe it purports to serve.

(xi) In matters of increasing the retention rates in the schooling systems, active participation of the traditional tribal panchayats is the prime need.

(xii) The reasons for non-participation in the school system seem to emanate from within the system in many tribal areas. A fresh look is required for formulation of any strategy and it should be done with an open mind and with consideration of the requirements of the particular tribe.

(xiii) The disuse of tribal dialects as medium of instruction merges to be a factor to take note of. It needs to be implemented with greater vigour. Same is the case for creating awareness of the various incentive schemes for promoting primary education among the tribal communities.

(xiv) The need for the training of the teachers in tribal life and culture in once again reinforced.

### 3. ACHIEVEMENT

(i) Among the household factors that have been found to contribute to achievement in language and mathematics are the parental education and the help received from the family. Somehow it has been found that help received from the family in mathematics has adversely affected the achievement of the child, perhaps, because the native mathematics operates at different bases than the decimal.

(ii) The language of achievement of such children who are in greater contact situation with the dominant culture groups show better achievement than those who are not. Obviously exposure to regional language facilitates the learning of the regional language. It needs to be remembered that the language test is in the regional language which is not the first language of the child and therefore, any conclusion drawn from such a finding will suffer from obvious handicap.

(iii) The teacher attendance and learners' achievement are interrelated. Simultaneously the teaching and learning process needs to be diagnostic and remedial in nature which is required in tribal situations because of the cultural lag between the tribal and non-tribal cultures.

(iv) The economic conditions of some of the tribes have also implications on the learning of the child. A curious relationship of the availability of enough food with the achievement was seen in the district of Dhar, Madhya Pradesh and Nanded in Maharashtra. It showed that the children who did not get enough to eat were achieving better than those who did. It could be explained that they had stronger motivation than the latter because deprivation lead to greater urge to improve one's own lot.

(v) In the districts of Rajgarh in Madhya Pradesh and Gajapati in Orissa it was found that those who were repeating a grade were performing better than those who did not repeat. This is in contrast to normal expectation.

(vi) The feedback received regarding the results of the unit tests and its correlation with achievement do not show expected behaviour of the data, simply because the tests are not of the diagnostic nature and not followed with remedial action.

(vii) Homework has, in some cases, shown positive results on mathematics achievement, though it is not reflected in every district or in every state.

(viii) The language of the home and that of the schools being different help from the family is sometimes detrimental to achievement of the child as is revealed in the district of Aurangabad in Maharashtra.

(ix) Provision of mid-day meal has certainly made an impact on achievement in language.

(x) Homework has also shown a positive relation with achievement in Phulbani district though such trends are not discernible in other districts.

(xi) In Karbi Anglong in Assam it is found that the education of the boys are at a premium as compared to that of the girls and yet in matters of getting sufficient food, it is the girls who get it mostly as compared to the boys. This is because the particular tribal society gives greater value to the girls and their birth is welcome in the family.

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## EFFECT OF HOUSEHOLD, COMMUNITY AND SCHOOL FACTORS

This study is based on the data collected for Baseline Achievement Study by N.K. Jangira, Tribal Study by C. J. Daswani, Gender Study by Usha Nayar, Teacher Motivation Study by N.K. Jangira, Assam Household Study by IIM, Calcutta, Planning for and with Tribals: The Case of DPEP by Mira Chatterjee, all under DPEP studies. More than 350 tables were compiled from these studies on which this paper is based

### ETHNOGRAPHIC NOTES

#### ASSAM

The two tribes namely, the Boro Kacharis and Miris, are significantly at two economic levels of subsistence. We would assume that the tribes covered in ST study are representative of the Boro Kacharis and Miri/Mishmig tribes. Before we go to analyze the data, It may be worthwhile to have a very brief ethnographic sketch of these two tribes so that data could be put in a proper perspective

#### *Boro Kacharis*

They are mainly settled agriculturists. Their main agricultural produce is rice and they are known for their indigenous method of seed preservation and irrigation. The transplanting of paddy is done by the women. Other household cottage industry is the silk production, with women running the looms. Almost every house has a loom. Another cottage industry is the cane and bamboo work.

The Boro Kachari society is divided into several clans. The inheritance laws are such that the eldest son gets one and a half share and the rest goes to remaining sons; married daughters have no right to property. They are a patriarchal society and nuclear families are increasing. The society is monogamous and tribal endogamy is the rule with clan's role diminishing increasingly. Marriages allowed by negotiation, mutual consent, elopement and intrusion; bride price is paid in cash and in kind and divorce and remarriage is allowed. The Boro Kacharis, although an endogamous tribe have now started marrying among Assamese and Bengalis and maintain social and economic ties with them. The natural resources like forest procedure etc are controlled by the village headman, elders as also individuals. The village council is significantly involved in settling disputes, planning and implementation of welfare and developmental activities. The Boro Kacharis give a good response to education and specially the initial primary education. Bodo is the medium of instruction. Most of them are bilingual with Assamese as the second language. The script used is Assamese and Roman. (The author was consulted by the then Ministry of Education, Govt. of India, CIL, Mysore in seventies on the script issue of Bodos—the leaders demanding use of Roman script and the authors argued with them that if the Bodo children had to integrate in the Assamese society, use of Assamese script would facilitate learning of Assamese language—the language of the state). The Boro Kacharis have exhibited participation in health and medical care programmes. Thus one can say that modernization is at work among them.

#### *The Miris/Mishmils*

The Miris' economic status can be classified as at subsistence level, engaged in paddy cultivation. The women are engaged in transplanting, threshing and weeding operation. They also participate in fishing. They are also good weavers. They work as agricultural labourers.

The social organisation is such that they can be classified as semi-nomadic riverine tribe. They are divided in two sections and further divided in clans. The oldest man in the family and oldest man in

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the village are highly respected. They are patrilineal and the property is divided equally among the sons. The daughters can take a share provided they bear the funeral expenses of the deceased which is substantial in the context of their economy and social custom. They have exogamous clans and are monogamous society. Cross-cousin marriage is most popular but the run-away marriage is also common as the arranged marriages are more expensive. The bride price is on wane among the educated. Remarriage is allowed in their society. Some inter-marriages in the neighbouring communities have also been reported. The village headman is elected. They speak Assamese as a second language and can communicate in Hindi. For written language they use Assamese and Devnagari scripts. They attribute illness or misfortunes to spirits and they take to animal sacrifice as appeasement of the spirits to cure such maladies.

### KARNATAKA

The maximum tribal population in this district is of the Naikda which is 1,07,646 out of 1,13,794 constituting 94.6 per cent total ST population. The Naikda are cultivators and agricultural labourers and settled people. Their children also mostly work as wage labour. They have several exogamous clan. Vertical extended family is the usual family structure. They are a patriarchal society. Adult marriage are the rules. Marriage by negotiation is a predominant form of marriage with bride price as the major practice. But the acculturative process has also led to adoption of dowry and may be termed as Sanskritization process. Monogamy is practised among them. Junior sororate is allowed. Widow remarriage is not practised. The Naikdas share water and also the burial ground with their neighbours and participate in festivities. Modern interaction is increasing through more contact and exposure to other cultures. They speak Kannada and use Kannada script. The literacy percentage (1981 census) was 19 per cent with 28.6 per cent male and 9 per cent female. They accept modern medicines and family welfare programmes.

### KERALA

In Kerala, the ST study covers two districts, viz, Kasargod and Wayanad. The tribal population of Kasargod is largely Marathi (55.9 per cent of tribal population) numbering 22,196 (1981 census). It is assumed that in the sample area, Marathis would be the major tribal group. The Marathis cultivate their own land, cattle rearing and dairy are supplementary occupations. Economically they are better off than the Paniyans who constitute 22.1 per cent among the tribal population of this district. Perhaps they are better off than most of the tribes in Kerala. Marathis are patrilineal society and are Sanskritised fully with endogamous tribal organisation but exogamous clans. They consult Hindu Brahmin priest (*purohit*) on all important social and religious occasions and it is socially valued. Bride price is a compulsory custom, sororate marriage is allowed. Polygamy is permitted. Divorce and remarriage is also allowed. Traditionally Marathis did not dine, intermarry or mix with other tribes. The Marathi headman attends all social functions of the community. They speak Marathi as the main language but also speak Tulu, Kannada and Malayalam. The scripts used are Malayalam and Kannada. According to 1991 census, the literacy percentage of this tribe is 38.2 per cent with 49.5 per cent male literacy and 26.5 per cent female literacy.

### MADHYA PRADESH

Madhya Pradesh has the maximum tribal population in India having as many as 46 tribes with a total population of 1,15,52,881 according to 1981 census. (Since tribal denominational figures for 1991 census is not available, we shall stick to figures of 1981 in order to have consistency and comparability.) The concentration of major tribes in DPEP districts in Madhya Pradesh is as follows:

1. Gond (Betul, Raisen, Panna, Sidhi, Bilaspur, Rajnandgaon)
2. Bhil (Dhar, Guna, Mandasaur, Rajgarh, Ratlam, Sehore, Shahdol)
3. Kol (Rewa)
4. Saur (Tikamgarh)

## EFFECT OF HOUSEHOLD, COMMUNITY AND SCHOOL FACTORS

### *Gond*

The Gonds are spread over the central and eastern part of the state. They are perhaps in the largest number in the districts mentioned above. Betul has a total tribal population of 2,59,979 with as many as 32 tribes. The largest population is that of Gond (including Arrakh or Arakh). In this district the Gonds are 2,42,120 consisting about 93.13 per cent of the tribal population of the district. According to Russell and Hirralal, they are the principal tribes of Dravidian family (Tribes and Castes of Central India). These views are shared by a number of scholars believing that the Gonds were pre-Dravidian tribes living in South India. Among the noted figures who are known throughout India for contribution to the Indian National History was Rani Durgavati who was a Gond.

There are a number of subdivisions among the Gonds, with Rajgonds as the most advanced. The marriage among the Gonds has certain singular features. Marriage procession starts from the place of the bride and the marriage ceremony is performed at the place of the bridegroom. The groom's father gives a feast to the bride's party and at times if they cannot afford, they simply distribute a piece of bread to each member of the party who eat it with some water and the feast is over. This is called, "Pani Torna". This reflects the economic conditions of the Gonds which could give us a perspective in which we ought to look at the educational problem of this particular tribe. Divorce and remarriage are allowed. Unlike Hindus, the Gonds bury their dead, head lying to the north. Their language is Gondi.

### *The Bhils*

The Bhils have been mentioned in Hindu scriptures as natives and yet the origin of the word is still shrouded in mystery. Eklavya, the great disciple of Dronacharya without the latter's knowledge, was a Bhil. Whatever may have been their mythical origin, the known history is witness to their being the most persecuted tribe at the hands of their neighbours. They had been mainly concentrated in South Western Rajasthan from where they spread to Western Madhya Pradesh by the onslaught of the Rajputs and Marathas. Detailed accounts of their persecution is available in a number of ethnographic and historical studies/reports. Our purpose, however, is not to go into those details but to set a context that this community has been deprived developmental benefits for long in the past centuries and therefore they are handicapped in all spheres of development including education.

The Bhils are tribe with exogamous custom. Generally adult marriage is the rule. A variety of marriages are customary such as *lagan-mandwa* (Hinduised marriage), *lugda ladi* (the traditional tribal marriage), *bherana* or *uchal jana* (marriage by intrusion), *ghees ke jaana* (marriage by elopement), and *ghar jamai* (matriarchal marriages).

Widow remarriage is socially accepted and levirate is permitted. Divorce is common and no formal procedure is there. Just leaving the husband and going to someone else's place would be enough. Polygamy is permitted but not practised these days because of economic reasons. Polygyny is unknown. The Bhils cremate their dead and death rites are accompanied by expensive feast to pacify the dead soul.

Bhil religion, animistic in-character has undergone tremendous change due to Hindu influence. The Hindu gods have entered their pantheon. Bara deo or Baba deo, is the most important village deity. Any developmental effort among the Bhils including education have to be visualised in this perspective. The Bhils have their own language known as Bhil.

### MAHARASHTRA

In the state of Maharashtra, three districts have been covered in the DPEP studies. They are Aurangabad, Nanded and Parbhani. In Aurangabad the tribal population, according to 1981 census is 74,888 of which 36,835 (49.18 per cent) are Bhils (including Bhil Garasias and Dholi Bhils). The tribal population in



the state is about 6 per cent of the population with majority of them below poverty line. As a result, women and children are working to earn the livelihood either as wage earners or helping indirectly in augmenting family income.

Most of the tribals are marginal agriculturists with their lands in hilly areas depending completely on rains for irrigation. Those employed as labourers get low wages (Minimum Wages Act is a myth to them) and the employment is seasonal. Exploitation is rather a rule than exception. Land alienation, bonded labour for repayment of loans and low prices for their produce are the usual practices accepted as providential lot. Access to markets is mostly the weekly markets where they are exploited by buyers' caprices.

The medium of instruction is not their mother tongue and the gap between their spoken language and language of the schools and books are widely different. Attendance in schools are also hampered by economic and social compulsions as social barrier of non-tribal tribal-syndrome is at work all the time.

In Aurangabad district, the largest population is of the Bhils as mentioned above. The Bhils are engaged in agriculture and animal domestication. Bhils are known to be nearer to Hindus as they have been greatly acculturated due to their proximity to the latter. Like Hindus, they are patrilineal and patriarchal, monogamous society with no strict taboos. The social organisation is such that the headman has great powers as social and economic arbitrator besides acting as government representative and having some sacred duties. The posts are hereditary. The Bhils speak Bhilli as mother tongue, though due to acculturative process and contact situation they also use Marathi and Hindi with Devnagari script. The literacy percentage, according to 1981 census was 11.05 per cent. The poverty is caused by low food production and less purchasing power. Nutrition is very low.

In the district of Nanded, the total ST population according to 1981 census is 1,46,395 consisting of 40,774 Andhs and 36,038 Kolam, i.e., 27.85 and 14.62 per cent respectively. The Andhs and Kolam both are primarily cultivators and wage labourers. Andhs also practise animal husbandry, hunting and food gathering—mainly forest produce. Both the societies are exogamous and patriarchal, though Kolams show increasing trend of nuclear family organisation. Dowry is now replacing the bride price practice among the Andhs. They engage the services of some communities as far as outside interaction is concerned. The Kolams maintain economic ties with other communities but other interactions are limited. They maintain a separate burial ground. The Andhs have a tribal council consisting of all the heads of the village families for solving social and economic disputes. The Kolams elect council community members for a period of five years and this council is responsible for social order. Whereas Andhs speak Marathi written in Devnagari script, the Kolams use Kolami, Marathi and Hindi in Devnagari script. The literacy percentage among Andhs is 17.47 per cent and among the Kolams it is 26.18 per cent according to 1981 census. The Andhs have a positive response to modern medicine whereas the Kolams prefer the indigenous medicine.

In the district of Parbhani, the Andhs have a population of 57,593 out of a total tribal population of 70,290 constituting 81.94 per cent. Other tribal groups are very minor in this district.

#### ORISSA

According to 1981 census, Kalahandi has a quite significant tribal population of 4,06,419. The main tribes are Gond or Gondo consisting of 37 per cent of population followed by Khond, Kond or Kandha, all listed as one with a rural population of 1,29,746 (31.67 per cent — 62,324 males and 64,182 females). The Konds are one of the most primitive tribes and economically the most backward.

Kalahandi is infamous for severe draught and under-nourished population. Any result has to be seen in this socio-economic background. It may be mentioned that any kind of formal schooling is not in the tradition of any tribe in India but the case of Konds is very dismal. The number of illiterate Konds in the district is 1,13,804, the literacy percentage being 10.04.

## EFFECT OF HOUSEHOLD, COMMUNITY AND SCHOOL FACTORS

### TAMIL NADU

The total population of the district Dharmapuri is 21,97,921 with ST population of 46,510 which is 2.12 per cent of the total population. The major tribes who inhabit the district are Malayali, 44.5 per cent of the total ST population, and Irulars (18.3 per cent). Both of them are engaged in permanent agriculture and work as plantation labourers. They also practise some home-based vocation like sericulture, honey collection, poultry farming, cattle and pig rearing as their subsidiary occupation. The Malayalis are a patriarchal society and have a nuclear family, with women having a control over family expenditure. The Irulars have exogamous clans which are patrilinear. Marriage among Malayalis involves alliance with exogamous groups which are equal in status with cross-cousin marriage as most preferred form of marriage. Bride price is compulsory. Although monogamy is the norm, polygamy is allowed. Divorce and remarriage is also permitted and junior levirate and sororate are allowed. The marriage is mainly among adults boys and girls after puberty.

Among the Irulars marriage is also after puberty, uncle-niece, and cross-cousin marriage is the most preferred. Marriage by negotiation, exchange and elopement are popular. The bride price is also common, widow remarriage is allowed except to brother-in-law. Both the communities exchange food and water with other communities, Irulars have a social organization consisting of head-man, junior head-man and his assistants for different functions on various social occasions. They choose their priest by common consent. The Malayalis use Tamil language and script. The literacy is 10.7 per cent (15.5 for male and 6.1 for female according to 1981 census). Some of the Malayali children are sent to tribal residential schools. The overall literacy is only 8 per cent (12.8 per cent for male and 4.6 per cent for female according to 1981 census). The girls are usually withdrawn from school after puberty. They speak Irula, Tamil and Telugu and use Tamil script.

# Effectiveness of Various Interventions for Improving Tribal Education : A Research Study

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## ABSTRACT

*The present study aims at reviewing the status of various interventions planned for improving education of Scheduled Tribe children in District Primary Education Programme (DPEP) States, viz., Assam, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa and Tamil Nadu. In this study an attempt has been made to study various aspects of these interventions, viz., nature and administration, organization, target beneficiaries, cost monitoring procedures and effectiveness. The results of the study may be useful for planning education in these States.*

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## Introduction

In the Indian Education System, education has limited connotation. It is largely concerned with the existing formal structure of education and the institutionalized methodology of imparting knowledge to individuals. Within this very system exist many sub-groups of individuals with specific needs and tribals are one of them. In fact tribals form a large group of individuals in the Indian society. For several historical, economic and social reasons the scheduled groups have remained economically backward and socially retarded even to this day. This is true with respect to their educational levels also. India has the second largest tribal

population in the world. According to 1991 census the total population of scheduled tribes in India is 67.7 million. In all, there are about 613 tribes living across the country.

A large proportion of tribal population, i.e., 62.7 million is living in rural areas while only 5 million live in urban areas. This ST population is 8 per cent of the total population of India and about 10 per cent of all rural people. Twenty-two of the twenty-six States of the country have about 90 per cent of the ST population. To plan education for this population is not an easy task. Therefore many studies have been conducted to look into various aspects of existing schooling facilities and welfare facilities available to them with a view to make microplans which take care of their requirements and needs.

A tribe may be seen as a sub-group of the society. The members of a tribe live in a common territory and have a common dialect which is the prime means of communication. Each tribe has a uniform social organization and possesses cultural homogeneity. The tribal population is characterized by a heterogeneous cultural pattern with variegated economic conditions and activities depending largely on ecology. There are also wide variations in psychological, cultural, social, economic and political background of various tribal groups. In a country like India there is a large number of tribes which because of historical and sociological reasons have strayed away from the mainstream. About 8.08 per cent of this vast country is the tribal (scheduled) population which approximates about 6.77 crore.

Unfortunately the literacy rate of this tribal population is very low. The national literacy rate of scheduled tribes, according to 1991 census, is 29.60 per cent, which is much lower than the national literacy rate, i.e., 52.19 per cent. In tribal population the female literacy rate is 18.19 per cent while the male literacy rate is 40.65 per cent. While literacy is only a means to education and not an end in itself, education tends to lead to economic benefits which are the result of the increased ability of the individual to utilize the information acquired through the process of learning. Therefore any educational planning for such a vast group of individuals should aim at educating all its members in the school-going age group. Education is in fact, an input not only for economic development of tribes but also for inner strength of the tribal communities. It also helps them in meeting the new challenges of life.

Education of tribals is an important task before the Government of India. Article 46 of the Constitution talks about promotion of educational and economic interests of SCs, STs and other weaker sections. To quote: "The State shall promote with special care the educational and economic interests of the weaker sections of the people and in particular of the SCs and STs and shall protect them from social injustice and all forms of exploitations."

Planning for education of children coming from tribal communities is not a

simple task. Though the entire educational programme for tribal children is looked after by the education department yet a comprehensive picture is hardly available. There are many activities related with education of tribal children which are managed by other departments. For example, almost in all the States, primary institutions catering to the needs of children from tribal communities are looked after by the education department while Ashram schools are the responsibilities of Tribal Welfare Departments and pre-primary education of voluntary agencies or Social Welfare Departments. Besides planning for ancillary services like scholarships, stipends, hostel, free book aid, midday meal, etc., are done at the State level. Therefore a clear picture of all the inputs in the form of interventions for education of tribal children may not be available for a given geographical area. Yet to plan for education of tribal children it is necessary to study the linkages between different schemes. It is sad to note that the scheme, once approved, is left to operate independently and no study is conducted to assess the effectiveness of such scheme. This sometimes results in duplication and wastage in terms of efforts and inputs.

While planning for education in tribal areas, attention has been paid to provide extra facilities in the form of various inputs for education of tribal children with a view to reducing existing disparities in educational access thus influencing retention and achievement of tribal children. The high dropout rate in general and that of tribal children in particular has to be tackled through attractive schemes beneficial for them. There are indirect evidences available of their positive impact on education of ST children. In case of States where Ashram schools are functional, the dropout rate has been reported as nil or very low. A separate study of the achievement of the children staying in Ashram schools could be taken up specially in the context of time spent in the school and compare it with the achievement of tribal children studying in other schools.

There is one interesting trend to note which relates to opening of educational institutions in various areas. Since there is pressure on higher enrolment in 6-14 age group and also on higher institutions like higher secondary schools, the number of such institutions is much higher as compared to the number of middle schools. Therefore the relatively advance areas with higher number of primary schools have reduced outlays for this sector while backward areas have more outlays for primary education.

Hostel facilities provided for tribal children away from their families is usually perceived as an additional stipend and not as something supporting education of children.

Another important provision in the form of merit-scholarships, stipends and other attendance scholarships, also suffers from the lacuna of planning. In case of most of the States, attendance scholarships are available to all boys and girls coming from tribal communities. This provision has been there for quite

some time. Some communities have taken full advantage of these facilities and come up to a considerable extent while others remain at the same level. Most of the States have generalized these benefits which have resulted in higher commitment on the part of the State. The second alternative could be evolving ways to develop methodology to give a major share of these benefits to the backwards of this tribal population. Even if these benefits at various levels of education are analyzed, as expected, the trend is more in favour of primary level education.

Some States have also developed instructional materials in tribal dialects for children coming from these tribal communities. The Constitution itself provides that every child be given facility of instructions through their mother tongue. But most of the States are still in the process of doing so. The problem of development of instructional materials in tribal dialects becomes more grave in cases where there are more than one major tribe. Instructional materials which reflect their culture and tradition is the need of the time.

Another special educational input for tribal education is residential schools widely known as Ashram schools in India. Since such institutions are very special efforts in the direction of tribal education, it is generally believed that there are significant attempts in the direction of higher enrolment of tribal children belonging to school = going age group. A number of studies have also been conducted to study the profile of such schools. Have these institutions, which are supposed to be nodal institutions, really had positive impact on enrolment, retention and achievement of such children? It is to be studied in order to ascertain their specific contribution towards tribal education.

The status of education of tribal children in DPEP status is alarming. As has already been stated the tribals in India form a very large group, still they have been cut off from the mainstream for a long time. As it is, India's literacy rate is very low. Further the literacy rate of scheduled tribes in India is much lower than the literacy rate of the general population. Tribals in India have their own language but most of them do not have any script. Since there cannot be a common language for them, it is necessary to teach them through their own language atleast at the initial stage. Later on the medium of instruction could be the State language.

Various tribal groups in India have different cultures. Therefore even while talking about education for tribals, no one can think of "an educational system" which is common to all the tribes. Various tribes within one State differ so much from each other in terms of ethnographic features that it is impossible to develop "a learning system" for them. Therefore there is a need to have tribe-specific learning arrangements which make full use of tribal culture and tribal traditions.

Some of the major constraints of planning for tribal education are scattered population, small size habitation, lack of facilities of transport and communication content, curriculum and textbooks not relevant to their culture and environment, medium of instruction, non-availability of teachers knowing tribal languages and

being aware of their economic deprivation. However, there are some favourable factors in tribal situation which could be utilised, e.g., an egalitarian social structure, strong community organization in certain areas, availability of traditional local institutions like youth dormitories and an intimate knowledge of their environment

After the attainment of Independence many changes have been noticed in various aspects of tribal culture—economic, social, political, religious and ethical life. If these changes are not channelized in a more scientific and systematic way, it is likely that the members of the coming generation will find it difficult to adjust in the new environment.

The scenario vis-a-vis enrolment and dropout is very crucial. Various States have planned different interventions to increase the enrolment of tribal children in the States. The enrolment ratio regarding tribal students in the age group 6-11 is given in Table 1.

The dropout rate of tribal children is also quite high in these States. Various studies have showed that the main reasons for high dropout rate of such children are work at home, helping parents, non-availability of textbooks, ill health, poverty and inability to afford education and lack of interest in education.

### Review of Related Literature

This is relatively a new area of research from the view-point of educationists. In the first and second survey of Research in Education brought out by M.B. Buch there is no separate mention of the education of disadvantaged groups of children or tribal children though some studies, general in nature, conducted at the primary level have been mentioned under the chapter Sociology of Education. In the Third Survey of Research in Education (1978-1983) also there is no independent section dealing with education of tribal children though some such studies have been mentioned under the chapter dealing with Sociology of Education. A couple of studies conducted in the area of education of tribal children at the primary/elementary level are as follows:

The study by Tripathi C.B. (1981) shows that the rate of increase in the enrolment in respect of Scheduled Castes and Scheduled Tribes was higher than the general rate during 1960-61 and 1965-66 but during the next five-year period it was far below the general rate. Residential facilities for tribal children were high in Bilaspur, Balaghat and Rajnandgaon while they were not so in case of Jabalpur, Satna and Rewa. The position of Bhils among Scheduled Tribes was worse than Oraons and Scheduled Castes like Gonds.

The two studies conducted on Ashram Schools by Desai, B. and Patel, A. (1981) and Pratap, D.R., Raju, C.C. and Rao, M.V.M. (1971) do not project a good profile of Ashram Schools. Pratap, D.R. and Raju, C.C. (1973) found the

TABLE 1.1  
Enrolment Ratio of Tribal Students (Year and State Wise)  
(6-11 years age Group)

State	1990-91			1991-92			1992-93			1993-94		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Assam	154.24	137.08	145.90	175.43	154.68	165.33	149.98	128.43	139.49	198.24	173.03	185.95
Karnataka	97.56	79.92	86.38	121.00	98.22	109.87	136.68	111.18	124.24	150.78	124.70	138.12
Kerala	136.31	128.37	132.41	133.15	126.46	129.86	130.67	124.53	127.66	123.01	122.59	122.80
M.P.	102.76	46.12	75.45	94.40	60.11	77.86	93.25	59.40	76.93	84.82	54.34	70.17
Maharashtra	132.90	106.35	119.95	137.27	111.44	124.62	151.18	119.54	135.60	135.13	113.61	124.72
Orissa	128.77	63.62	98.96	128.27	63.78	96.85	130.69	65.22	98.86	125.22	58.09	90.90
Tamil Nadu	122.96	97.52	110.54	124.01	98.60	111.60	131.08	104.29	118.05	136.52	113.22	125.18
India	126.78	78.60	103.35	125.63	82.59	104.70	126.71	88.64	108.19	123.90	88.80	106.97



working and physical conditions of Ashram schools unsatisfactory. Some of the teachers working in these schools did not stay there and visited schools occasionally. The study pointed out that the schools were treated as source of income rather than avenues of service. Desai, B. and Patel, A. (1981) found that in most of the Ashram schools the number of children enrolled was much higher than the prescribed number (120 students each) and except in two schools, the 1:1 ratio among boys and girls was not maintained. Only 18 out of 22 Ashram schools had 100 per cent teacher strength and in some cases the educational qualifications of teachers was Class VII. The overall wastage rate reported in these Ashram schools was 44.42 per cent. Masavi, M. (1976) in his study found the wastage rate to be 65 per cent at the primary level, however, only 9.1 per cent of the total enrolled children of Class I could complete Class IV. The stagnation rate at Class I was very high which came down considerably for classes II, III and IV. The overall wastage in Ashram schools was 46.7 per cent. The main causes for wastage and stagnation were found to be socio-economic conditions, ignorance among tribal parents, ill equipped teachers, teaching in alien languages, physical illness and inappropriate curricula.

The study by Joshi, S.D. (1980) besides other things, found that the majority of teachers did not have a specialized training for working in backward areas.

Srivastava, R.C. (1981) in his study found that unproductive and traditional type of educational system for the tribals was the cause of indifferent attitude of tribal parents towards their children's education. Besides, lack of necessary facilities and equipments for teaching was the cause of lack of motivation for education among the tribals.

In an evaluative study conducted on hostels and Ashrams for tribal girl students, Jha, P. (1985) found that like most of other beneficiary schemes meant for tribals, mostly the rich amongst the tribal community availed of the facilities of hostels and Ashrams. The number of students admitted to the hostels was much higher than the number expected and the superintendents of these hostels were neither trained nor qualified. The hostel rooms were overcrowded and did not have basic facilities. The scholarship given to girls were sometimes misappropriated by their parents making their girls' living very difficult. The amount of this scholarship was also found to be inadequate. In a contemporary study conducted by Sharma, R.C. (1984) it was found that introduction of different incentives like free uniforms, textbooks and boarding and lodging facilities resulted in higher enrolment of SC and ST students including girls. This increase in case of SC and ST children ranged from 49.2 per cent to 92.7 per cent.

There is one more important aspect of these facilities which has been mentioned in the report of the study "Scheduled Castes and Tribes—A Socio-Economic Survey" by Parvatham, C. (1984). She says that nearly one half of the sample is not aware of the Constitutional provisions meant for the development

of the downtrodden. At the same time even those with such knowledge have not availed them as expected. The reasons for not availing these benefits are very many. To quote: "According to the people in the study, officials in the administration are apathetic and are not sincere in implementing the provisions. The SCs and STs are critical of their so-called leaders who according to them are selfish. They are of the opinion that the educated urban = based SC and ST elites have used the new opportunity for themselves in narrow circle and thus made the entire provisions a family issue .. only certain families coming from particular subcastes are taking away the lion's share leaving the rest of the deserving SCs and STs where they are."

A study conducted by Ekka, E.M. (1990) on Development of Tribal Education in Orissa after Independence showed that percentage of bigger habitations in the tribal inhabited areas is very negligible. This leads us to conclude in any State with high tribal population, that educational interventions should be planned at the level of various habitations, big or small. Another study conducted by Biswal, G.C. (1991) in Orissa found that as compared to boys, fewer girls in the area got enrolled in the schools. As far as quality of teachers working in these schools is concerned, most of the teachers were found to be non-tribal and less qualified. Very surprisingly the study found that the dropout rate at the higher level is higher than that at the lower level.

Two studies, one by Bhargava, S.M. (1989) and another by Kamble, P.R. (1992) were carried out to conduct survey of educational facilities for weaker sections in Orissa and Maharashtra respectively. The study by Bhargava (1989) found that educational facilities for Scheduled Tribe habitations are poorer in comparison to other habitations in the district and the facilities of textbooks, free uniforms, stipends and midday meals were available to children coming from tribal communities. Kamble (1992) found that in the opinion of Headmasters 74 per cent students take the advantage of facilities available for tribal children, viz., free textbooks, uniforms, writing materials and nutritious meal and 84 per cent of such students are regular in their attendance. One very significant finding of the study was that the Headmasters opined that the government facilities are useful to arrest wastage in education but they are not useful to increase the "percentage of pass" students. The dropout rate (for Devgad taluka) was much lower than the national dropout rate.

Another study done by Chitnis, S. (1974) also showed that SC and ST children had a very poor opinion about the facilities available to them.

Sachchidananda and Sinha, Ramesh P. (1989) found that most of the ST students got the advantage of special programmes planned for them and recommended that teachers from the same community should be appointed in schools where population of this community is high. The States should also see that facilities available to these communities should go to the most disadvantaged groups among them.

An evaluative study of pre-matric scholarship for SC and ST children was conducted by Srivastava, L.R.N. (1988-90). He found that in many cases the amount of this scholarship was not adequate. These scholarships were also not given to students in time. One significant finding of the study was that the scholarship was used by ST students for purposes other than education.

All researches mentioned above are concentrated in the areas of enrolment, retention, dropout, teacher preparation and facilities and would be significant for planning for tribal education in various States.

### **Specific Objectives**

The objectives of this study were to study the following issues:

1. What is the scheme? How is it organized and administered?
2. How are the target beneficiaries defined?
3. What mechanisms are employed to ensure that the benefits reach the intended beneficiaries?
4. What is the total annual cost of the scheme? What is the estimated annual cost per beneficiary?
5. What evidence is available on the effectiveness of the schemes in reaching intended beneficiary?

### **Methodology**

It is a short-term project for which no fresh collection of data from the field was envisaged. The information required has been derived from secondary sources, i.e., Annual Reports, Statistical Data, Educational Plans and Tribal Sub Plans of the States. For authenticity of data the State Education Secretaries were requested to supply the information through their DPEP State Coordinators or DPEP Tribal Study State Coordinators. Simultaneously, various reports and data available with different organisations were also analyzed vis-a-vis these interventions.

For collection of information from the States three instruments were prepared. These instruments covered various aspects of interventions like nature of organization and administration, target group, cost, monitoring procedures adopted and effectiveness of the scheme. This information was further analyzed in terms of types of interventions.

### **Findings**

The analysis showed that the DPEP States have planned various interventions for education of tribal children which can be classified under the following categories.

## EFFECTIVENESS OF VARIOUS INTERVENTIONS FOR IMPROVING TRIBAL EDUCATION

- Academic/Educational Facilities
- Stipends/Attendance Scholarships
- Welfare Interventions
- Interventions/Incentives for Teachers
- Ashram Schools
- Miscellaneous including Tribal Hostels, Boarding Grant, Subsidised Hostels, etc.

### INTERVENTIONS

As described above various states covered differ in terms of interventions planned for their ST population both in terms of quality and quantity. The emphasis on one type of intervention in a State is indicative of one type of need of that State. The idea behind introducing each intervention is attracting children towards the school and retaining them even if it means helping them monetarily. Not many interventions are available for improving the quality of teaching-learning except instituting teachers award scheme, perks for teachers working in tribal areas (which is given to all other types of employees serving in tribal areas) and development (but not systematic) of primers in tribal dialect or primers in regional languages specially meant for tribal children so that they identify themselves with the tribal life and tribal culture reflected in those books. No specific teachers preparation programme has been developed by the States (except the attempt made by Madhya Pradesh) to orient teachers in the methodology of teaching tribal children and make use of their environment and culture to improve the quality of teaching. No special programme has been developed to maximize the capabilities of tribal children. Ashram schools have been opened by the States but these Ashram schools have very limited capacity to enrol tribal children. Attempts have been made to study various aspects of Ashram schools in different States thereby giving us their profile but their effectiveness as an intervention in improving learning by ST children has not been assessed. Not only this, whether or not pre-matric scholarships in any way result in better quality learning is yet to be ascertained.

The role of any intervention in the form of monetary benefits, be it direct or indirect, has motivating value in a limited sense. After some time it ceases to have the same force and gradually becomes a routine part of the system. To quote the twenty-eighth report of the Commissioner for Scheduled Castes and Scheduled Tribes (1986-87) submitted on November 23, 1988: "While the programme of scholarships and stipends has significantly grown there are some weaknesses which have to be noted carefully. The coverage under the assistance programme increases as one moves up the educational ladder. Thus every student belonging to SCs and STs subject to certain conditions is eligible for the post-matric scholarship."

*Prematric Scholarship*

The 28th report of the commission of SC and ST also talks about the effectiveness of pre-matric scholarship as one to bring ST children to primary schools. It also refers to the delay in getting this stipend in time. To quote: "the little assistance which pupils receive at the primary, middle and secondary level also comes too late. It is necessary that scholarships and stipends to the students must simulate the support which a child gets in an ordinary home. A method must be devised whereby a student can claim the assistance the day he joins the school."

The report suggests that *while leaving the school the student should be issued an eligibility card by the head of the institution which gets him access to such facilities immediately without waiting for the formal sanction.*

*Ashram Schools*

The condition and quality of inputs and the functioning of schools with large ST population are not very encouraging. Most of such schools practically remain single teacher schools because the unwilling teachers who are either punished by being transferred to tribal areas or are forced to work in tribal areas as a part of the policy are usually absent from the school. The quality of teaching-learning materials in the school is also of a low quality. The 28th report of the Commission of SC/ST found that a number of schools situated in tribal areas remained closed for certain periods of time and in a number of cases these schools had not functioned since the beginning of the academic year. *To retain these teachers in the tribal areas more interventions in the form of facilities and provision of quarters for non-local teachers have to be planned.*

Many States have favoured establishment of Ashram Schools for children coming from Tribal communities. Such states include maintenance of old Ashram Schools and opening of new Ashram Schools every year in their Tribal Sub Plans. The basic problem related with the ineffectiveness (or being not so effective) of these Ashram schools is that those tribes which are basically agricultural communities cannot make use of these schools. No one can expect ST children belonging to 6-14 age group staying in such schools only to pursue their studies. They are completely cut off from their society which in no way can be appreciated either by them or their parents. *Besides establishment of Ashram schools does not guarantee coverage at the primary level. Not very systematic academic inputs like relevant curriculum, development of relevant teaching learning materials, teacher training in methodology of teaching have gone into this system.* Physical inputs like residential facilities, free food are there but what type of food is given, is it nutritious, what is its quantity, etc., have to be studied carefully. One set of dress or uniform does not last for one session. The quality of these clothes is also

## EFFECTIVENESS OF VARIOUS INTERVENTIONS FOR IMPROVING TRIBAL EDUCATION

very poor. Under these circumstances such schools cannot achieve the objective which they are supposed to achieve. A couple of studies have been conducted to study the profile of Ashram Schools in various States [Das. N. (1963), Dave, P.C. (1954), Ananda, G. (1994), Patnayak, N. (1957), Shaw, B.N. (1958, 1959), Sujata, K. (1987)] but no systematic indepth study of any of the components mentioned above has been carried out. *There is a need to sponsor a couple of indepth studies in each of these components in tribal populous States in India.*

*An educational complex having varied types of schools, viz., primary schools, sub-schools, preprimary schools, preprimary-cum-primary schools, non = formal schools and extension centres could be visualized for these areas.* The organization of such institutions could be entrusted to Tribal Development/ Welfare Department and Education Department jointly. Since District Institutes of Education and Training are being made more functional, they could also be involved in this task in a big way. Micro-planning is a must for these areas under which the process has to be target-oriented with backward movement. At present this is the only way to tackle this grave problem.

### WELFARE INTERVENTIONS

Most of the interventions introduced by the State Government fall in this category. These include provisions for uniforms, mid-day meal, free chappals, free conveyance and free medical aid. Provision of free textbooks, free learning materials, free writing materials though academic in nature may also fall in this category. These welfare interventions are basically aimed at welfare measures and are powerful instruments for increasing enrolment ratio in the schools. Looking at the quantity of these materials, one gets the feeling that they do not fulfil the basic requirement of the child for the whole year. There is no parameter to assess the quality of these inputs.

To make such interventions effective both the quality and quantity of the incentive or the facility are to be ensured.

### INTERVENTIONS FOR TEACHERS

The interventions for teachers comprise of only two types of incentives/perks for teachers working in tribal areas and the scheme of teacher award. No academic input has been mentioned by any of the State coordinators for improvement in the quality of teaching or increasing the capabilities of the teachers except a teacher training programme by Madhya Pradesh. No mention of any kind of teacher's handbook or helpbook for teachers working in tribal areas has been made. These teachers once posted in tribal areas lose touch with the outer world and are confined to their schools only. This results in lack of interaction with other

members of their community. Some training programmes are conducted for them once a while but not all of them are involved in these programmes.

There is a strong need to develop teaching material, handbook and training package for teachers working in tribal areas. A systematic training programme should be developed for them which may be compulsory for each teacher to attend if she is working in a tribal area. The nodal agency for this type of intervention could be State Councils of Educational Research and Training. This institution will have to work in close collaboration of Tribal Welfare Department of the state.

Stipends and attendance allowances are aimed at increasing the enrolment in the schools and ensuring attendance. They have been successful in the attainment of these objectives as a result of which the enrolment ratio in the schools has gone up. Since they are instrumental in reducing the financial burden on parents of ST children they have always been welcome by the parents. Almost all the States have provided for such interventions.

Very few states have the provision of this type of scholarships. In fact this is a good measure for promoting talent and should be encouraged.

### *Hostel Facilities*

Besides Ashram Schools States have also made provisions for hostels for boys and girls separately. These hostels provide free residential facilities to ST children studying in various institutions.

More of such facilities are required at the higher level.

### **Recommendations**

The recommendations of the study are as follows:

1. It is important to plan various interventions at the level of various ST habitations big or small. Habitations with high ST girl population should have specific interventions exclusively for girls.
2. The benefits of various schemes should be available to all enrolled regular ST children automatically.
3. Eligible students, on the basis of the certificates issued by the school should become eligible to these benefits automatically. A mechanism should be evolved by each State for the same purpose.
4. Extensive monitoring procedures should be developed at the district level for monitoring the access to the benefits by eligible ST children.
5. A small group could be formed by each State to review the situation of pre-matric scholarship and other stipends.
6. Merit scholarships at the district level should be visualized to recognize talented ST children.

## EFFECTIVENESS OF VARIOUS INTERVENTIONS FOR IMPROVING TRIBAL EDUCATION

7. More programmes to recognize the capabilities and achievement of ST children studying in schools could be planned.
8. An account may be opened in the name of each child in the neighbouring post office which could be jointly operated by one teacher of the school and the Headmaster and the money should be spent on education and welfare of the school-going child only.
9. The minimum quantity and good quality of the incentives/benefits should be ascertained by a small group constituted by the State Government.
10. Monetary incentives to parents could be substituted by grain for the family. This will take care of the diminishing value of money.
11. All the States should take up systematic programme of development of instructional material and teaching material in tribal dialects at the primary level and teacher training programmes modified accordingly.
12. The curriculum followed in Ashram schools and other schools having ST children should be revised in the light of Minimum Levels of Learning (MLLS) and achievement of MLLs to the mastery level should be ascertained through continuous and comprehensive evaluation.
13. Systematic programme of in-service training should be developed for teachers coming from tribal and non-tribal communities separately.
14. An educational complex having varied types of schools, viz., primary schools, sub-schools, pre-primary schools, pre-primary-cum-primary schools, non-formal schools and extension centres could be visualized for tribal areas.
15. In order to strengthen the monitoring system and involve community in the educational programme, VECs should be involved in the monitoring of educational schemes and programmes to a greater extent.
16. Community should be involved through various committees including Village Education Committee and Block Education Committee in monitoring of State level programmes. Non-Government organisations of national repute should also be made a part of the monitoring machinery.
17. State could plan for non-formal schools in tribal areas with a need-based curriculum and instructional materials.

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# Educational Problems of Tribal Children

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## ABSTRACT

*The present study aims at mapping the existing provisions for primary education in the tribal areas as well as their utilisation by the recipient population. It has been carried out in seven DPEP States viz Assam, Karnataka, Kerala, Maharashtra, Madhya Pradesh, Orissa and Tamil Nadu. The aspects studied include educational infrastructure and facilities available, status of teachers in tribal areas, status of curriculum and teaching learning materials, use of tribal language, status of school enrolment and school dropout, monitoring, evaluation and community participation.*

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## Introduction

The present paper attempts to summarise some of the significant findings of the tribal study which was conducted under the District Primary Education Programme (DPEP). The study was commissioned since it was required by International Donor Agency (IDA). Reportedly, the IDA was concerned about the impact of all proposed interventions under the DPEP on tribal population in the concerned districts. It was, therefore, required that a sample survey of tribal population in the DPEP districts be carried out in order to ascertain the viewpoints of tribal parents, tribal community leaders and tribal children and teachers regarding both

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The present study has been taken from the document *Research Based Interventions in Primary Education: The DPEP Strategy* (1994), National Council of Educational Research and Training New Delhi

the availability of primary educational facilities and subjective evaluation of such facilities. It was also required that an overview of community participation in primary education in the tribal areas in these districts be provided.

The terms of reference for the study were provided by the funding agencies. All concerned agencies such as UNICEF and the World Bank, together with the Department of Education, MHRD were consulted periodically throughout the course of the study and they were kept abreast of the progress of the study

## **Objectives and Research Design**

### *Focus of the Study*

The focus of the study was to map the present provisions for primary education in the tribal areas as well as their utilisation by the recipient population. At the same time the study attempted to discover the attitudes of tribal parents, opinion leaders, teachers of tribal children, administrators of tribal educational institutions as well as other community members towards both the availability of educational opportunities as well as expectations from the educational system as a whole. It was envisaged that such a focus will enable the planners at the district level to make more meaningful and direct interventions for ensuring quality education in tribal areas

### *Objectives*

The objectives of this study were :

- To carry out a sample survey of the educational infrastructure and facilities available in the tribal areas with a view to identify gaps, if any, in the available infrastructure and facilities.
- Status of teachers in tribal areas including their availability, background, qualifications, training, punctuality and problems.
- Status of curriculum in operation and the teaching learning materials being used with special reference to use of the tribal language in the writing of teaching-learning materials as well as in the classroom transaction.
- Status of monitoring and evaluation of primary education including administrative structures.
- Status of school enrolment and school drop-out with special reference to factors affecting enrolment and drop-out of tribal girls.
- Status on convergence of various departments providing services and facilities in tribal areas.
- Status of community participation in the educational programme and management of schools.

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Both qualitative and quantitative data were collected with reference to the above terms of reference.

### *Selection of Areas for Study*

The study was conducted in the tribal districts in seven States, viz., Assam, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa and Tamil Nadu. The study was carried out in two districts in each of the states. In the case of Maharashtra it was decided by the State Government to confine this study to only one district. In the case of Madhya Pradesh, four districts were selected for the present study. The study was conducted in one block in each of the selected fifteen districts on the basis of highest tribal population.

It may be noted that Madhya Pradesh and Orissa were clubbed with the other five states although these two states do not form a part of the six DPEP states being considered under the World Bank provisions. Of the six World Bank DPEP states, five (Assam, Karnataka, Kerala, Maharashtra and Tamil Nadu) have been covered by the study. The sixth state, i.e., Haryana was excluded from the study in the absence of any significant tribal population.

### *Sample*

The sample for the study was collected from ten villages in each of the selected blocks.

The total number of children covered in each village was 23 girls and three boys from the primary school; three girls and three boys from the NFE centre; six non-enrolled children (three girls and three boys) and two school drop-outs (one girl and one boy). In locations without an NFE centre the six children to be selected from NFE centres were selected from the school instead, making the total number of children from the primary school, 12. In villages without a primary school, 12 children were selected from the NFE centre.

All the teachers of the selected primary schools, with a maximum of five per school, and one instructor from the NFE centre were selected for the study. A sample of five pairs of parents (making the total number of parents 10) was also selected. Two male and three female members of the concerned community were also selected for collecting the data. In this manner, the maximum number of persons covered per village was 41.

### *Methodology*

A set of eight instruments was prepared for collecting the bench-mark data from

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**List of Sample Blocks**

<i>States</i>	<i>Districts</i>	<i>Name of the Blocks</i>	<i>Percentage of Tribal Population</i>
Assam	1. Darrang	Udargiri	20.16
	2. Morigaon	Bhurbandha	30.14
Karnataka	1. Kolar	Gowribidanvir Bangarpet	15.19
	2. Raichur	Devadurga	20.16
Kerala	1. Kasargod	Kasargod	4.30
	2. Wayanad	Mananthavady	19.83
Madhya Pradesh	1. Betul	Bhimpura	83.79
	2. Ratlam	Bajana	91.02
	3. Raigarh	Kansaval	82.50
	4. Shahdol	Pushprajgarh	78.31
Maharashtra	1. Nanded	Kenwat	31.92
Orissa	1. Kalahandi	Thuamul	55.65
	2. Rayagada	Kolnara	68.75
Tamil Nadu	1. Dharmapuri	Pippireddipatti	18.24
	2. Thiruvannamalai	Jawadhu	61.89

the field. Each instrument, except the eighth instrument, was divided into two parts. The eighth instrument has three parts. Part I was further divided into two sections, viz. Section A consisting of items for collecting quantitative data and Section B consisting of items meant for collecting qualitative data. Part I, as a whole, consisted of items which had to be answered by the respondents directly. Part II of the questionnaire was designed to be filled in by the investigator with the help of documents/information available in that location.

Table 1 (see Annexure) provides diagrammatic details of the various tools developed for the study.

In each village of focussed group discussion was also organised by the field investigator where issues related to the objectives were discussed with the members of the community. The details of these are given in the Notes Section.

### *Training Manual*

A training manual was used by master trainers to train field investigators who collected the data from the sample villages. The training of master trainers was organised by the Department of Non-Formal Education and Education of SC/ST in the NCERT at the national level. A team of three members from each of the seven states, i.e., State Coordinator, Professional Assistant-cum-Supervisor and a Computer Assistant were trained. The state level team, in turn, trained the field investigators in the respective states with the help of one person from DNFEESC/ST.

## EDUCATIONAL PROBLEMS OF TRIBAL CHILDREN

### *Status Report*

In addition to the survey conducted with the help of the eight instruments, each state was asked to write a status report on the education of the tribal children in the state. The status reports cover the following aspects :

- Introduction to the tribal population in the state
- Information about various tribes in the state
- Developmental problems of tribal population
- Educational problems of tribals
- Schemes for promotion of education of tribals carried out by the state.
- Status and availability of teaching-learning materials in tribal languages of the state
- Summary of important studies related to tribal population in the state, giving major findings
- State plans for education of tribals in Eighth Five Year Plan.

The status report in each state was necessarily based on secondary data. All status reports from the seven states have been completed.

### *Survey Report*

Based on the actual field data collected through the field work, seven state survey reports have been written by state coordinators who were in charge of the tribal study in the concerned states. Each survey report includes the following :

- Objectives of the tribal study
- Processes of the tribal study in the respective state
- Geographic and demographic description of the selected districts and blocks
- Instrument-wise data analysis
- Analysis of the investigators' diaries
- Analysis of focussed group discussion
- Results and conclusions.

### *Analysis Plan*

- A set of eight instruments were prepared for collecting the data.
- A training manual was prepared to assist the field investigators who were appointed to collect the data.
- All the eight instruments and the training manuals were translated into seven languages (Assamese, Hindi, Kannada, Malayalam, Marathi, Oriya).
- Workshops were held in all the states to train the field investigators. In

each state a representative from Delhi was present to participate in the workshop. Special attention was given to focussed group discussions in which issues related to the objectives were discussed with the members of the community.

- A data entry programme for all the eight instruments was developed in the NCERT. This software was sent on floppies to all the seven states.
- Data was collected from all the blocks under the study by the field investigators and was entered on the floppy.
- The floppies with the data were sent to NCERT from all the states.
- State reports were prepared.
- Data of the entire sample was processed in the DNFEESC/ST, NCERT.
- Instrument-wise computer analyses were carried out
- Finally with the aid of these computer reports a final synthesis report was prepared.

### *Synthesis of State Reports*

On the basis of the seven survey reports generated at the state level a national synthesis report was prepared by the research team in the DNFEESC/ST. The national synthesis report attempts to capture significant findings as revealed in the state survey reports. Given the fact that tribal populations in the seven states not only vary significantly from each other but have different profiles within the state educational networks, the synthesis report, naturally, highlights only those areas where broad comparative statements can be made. The synthesis report also highlights the more significant interventions that are called for under the DPEP.

### *Tribal Study and DPEP*

In order to plan systematic interventions for primary education for tribal children in all the DPEP districts, it would be necessary to collate at the state level, both the status reports as well as the survey reports. In-depth reading of these two documents at the state level is, therefore, essential for any realistic planning of primary education for tribal children.

### **Key Findings**

#### *Educational Facilities*

- Out of the five DPEP states, in both Maharashtra and Tamil Nadu all the villages surveyed had a primary school. In Assam, Karnataka and Kerala 75 to 90 per cent villages had primary schools. Madhya Pradesh and Orissa had primary schools in 84.62 and 75 per cent villages, respectively, covered under this study.

## EDUCATIONAL PROBLEMS OF TRIBAL CHILDREN

- Out of the five DPEP states, Maharashtra had the largest number of Ashram schools followed by Tamil Nadu, Kerala and Karnataka. Villages covered in Assam did not have any Ashram/residential school. Less than 20 per cent of the villages covered in Madhya Pradesh and Orissa had Ashram schools.
- Assam, Orissa and Tamil Nadu show fair presence of NGOs at the village level.
- The analysis of responses to a question whether tribal development programme was successful or not, the community leaders in Karnataka, Madhya Pradesh and Maharashtra felt that these programmes were unsuccessful.

### *Teachers of Tribal Children*

- Educational qualifications of teachers in the seven states range from below matric to post-graduate.
- In all the states the sampled teachers have either pre-service training or in-service training. No teacher is untrained.
- Most teachers and community leaders ascribe poor attendance of tribal children in school to economic reasons, including household duties and working on the farm; low parent motivation is also listed as a significant reason for children not attending school. There is a similarity of responses given by children, community leaders and teachers (for details refer to Table 2 and Table 2a).

TABLE 2  
Reasons for Children not Going to School Regularly  
as Given by the Community Leaders and Teachers

<i>Opinion</i>	<i>Assam (%)</i>	<i>Karnataka (%)</i>	<i>Kerala (%)</i>	<i>M P. (%)</i>	<i>Maharashtra (%)</i>	<i>Orissa (%)</i>	<i>Tamil Nadu (%)</i>
1. Financial							
a. Teachers	96.97	93.02	80.90	90.00	81.82	63.33	82.35
b. Community leaders	100.00	98.55	78.57	92.86	100.00	100.00	87.00
2. Household Work							
a. Teachers	72.73	88.37	50.83	60.00	100.00	93.33	88.24
b. Community leaders	68.83	23.19	30.00	25.00	16.67	14.29	34.15
3. Health Problem							
a. Teachers	51.52	23.26	76.65	20.00	27.27	10.00	41.18
b. Community leaders	68.83	23.19	82.86	25.00	16.67	14.29	34.15



# EDUCATIONAL PROBLEMS OF TRIBAL CHILDREN

Opinion	Assam (%)	Karnataka (%)	Kerala (%)	M.P. (%)	Maharashtra (%)	Orissa (%)	Tamil Nadu (%)
4. Agricultural Work							
a. Teachers	60.61	83.72	65.17	50.00	100.00	46.67	64.71
b. Community leaders	53.25	94.20	5.71	71.43	100.00	84.13	75.61
5. School Atmosphere							
a. Teachers	57.58	9.30	22.47	10.00	27.27	16.67	5.88
b. Community leaders	15.95	30.43	20.00	14.59	—	3.45	—
6. Teachers' Behaviour							
a. Teachers							
b. Community leaders	19.48	76.62	18.57	20.29	17.86	4.76	29.27
7. Children's failure in examination							
a. Teachers	18.18	—	30.34	—	—	—	—
b. Community leaders	33.77	21.74	65.71	17.86	—	1.59	31.71
8. Unwillingness of the parents							
a. Teachers	57.58	27.91	70.79	5.00	27.27	6.67	5.88
b. Community leaders	3.90	4.35	25.71	—	—	—	—

Note: It may be noted that the total number of responses (Yes + No) does not conform to 100. In such cases, it may be understood that certain number of people have not responded

TABLE 2A  
Reasons for not Going to School/NFE Centre Regularly

Reasons	Assam (%)	Karnataka (%)	Kerala (%)	M.P. (%)	Maharashtra (%)	Orissa (%)	Tamil Nadu (%)
1. Do you go to school/ NFE Centre regularly?							
1. Yes	53.77	59.83	69.51	70.77	91.74	74.56	93.23
2. No	24.34	40.17	34.17	29.03	7.44	23.44	4.72
3. No response	1.89	—	1.25	—	0.32	—	—
If no, reasons for irregularity							
a. You feel sick	25.53	90.43	20.73	39.12	—	—	6.25
b. You had to help your parents in their work	51.06	88.04	68.29	9.48	66.67	62.07	12.50
c. You had to go out of the village frequently	5.31	33.69	23.17	13.86	11.11	17.24	12.50
d. You had to look after your brothers/ sisters	3.53	28.29	9.76	17.51	11.11	24.14	6.25

# EDUCATIONAL PROBLEMS OF TRIBAL CHILDREN

Reasons	Assam (%)	Karnataka (%)	Kerala (%)	M.P. (%)	Maharashtra (%)	Orissa (%)	Tamil Nadu (%)
e. Your classmates were not friendly	10.00	3.26	—	9.48	11.11	6.90	—
f. You did not like the school	15.95	30.43	—	14.59	—	3.45	—
g. Teacher scolded you and did not help you in study	20.21	3.26	—	2.02	11.11	20.69	—
h. Non-availability of textbooks/ exercise books	52.12	29.34	9.76	10.94	33.33	17.24	—
i. Homework was not done	9.57	36.25	3.66	5.83	11.11	—	—
j. Parents shifted to other place due to drought or excess rainfall	7.44	2.17	12.20	—	—	—	6.25
k. Teacher teaches faster than you understand	17.02	1.08	2.44	—	—	3.45	6.23
l. Teacher was not regular	15.95	11.95	1.22	—	—	17.24	—
m. Fear of punishment from the teacher	11.52	7.60	1.22	—	—	—	6.25

- Most of the teachers said that they faced a number of problems when teaching tribal children which include language of the learners, irregular attendance, lack of infrastructural facilities, lack of teaching-learning materials and multigrade teaching.
- The specific learning problems of tribal children according to teachers, relate to low learner motivation, poor parent participation in the education of children, illiterate family background, irregular attendance and uninteresting curriculum. The language problem was mentioned by teachers in three DPEP states, viz. Karnataka, Kerala, Maharashtra in addition to Madhya Pradesh and Orissa.
- The most prominent problem listed by a large number of teachers related to the inability of girls in attending school regularly on account of household chores and duties. Lack of interest on part of the parents in sending girls to school was another problem listed by many teachers.
- Not all the facilities provided under the Operation Blackboard were available in the schools covered.
- Special facilities available for tribal children varied from state to state.
- In states where non-formal education programme is in existence teachers encourage non-school-going children to attend NFE centres.

### *Teachers and School Programme*

- Most teachers, except those in Maharashtra, feel that the textbooks are relevant to tribal boys and girls. In Maharashtra over 60 per cent teachers feel that the textbooks are not suitable for tribal children. Parents of children covered under the study shared this opinion with teachers. In Maharashtra the major cause for unsuitability of textbooks for tribal children was the language of the textbooks. In Tamil Nadu a large number of teachers feel that the textbooks are not comprehensible for children. Likewise nearly one-third of the teachers of Karnataka find textbooks too difficult (for details refer to Table 3).
- Regarding comprehensibility of textbooks, teachers in Madhya Pradesh and Orissa feel that the children find textbooks difficult. Most teachers feel that a special teaching-learning methodology needs to be adopted for teaching tribal children.

### *Tribal Parents*

- A large number of tribal parents have no formal education themselves.
- There seems to be high correlation between attendance in Anganwadis and attendance in schools.
- Most parents in all the seven states are satisfied with the school system as it operates today.
- Parents' attitude towards change in the educational system reveals that between 50 to 70 per cent do not want any change in the educational system except in case of Maharashtra where more than 50 per cent of the parents are looking for a different educational system.
- Most parents in all the states felt that girls should be given health education and education in vocations like tailoring.
- Teachers, parents of tribal children and community leaders were asked to give their opinion on various aspects of participation in educational programmes meant for tribal children. Their opinions are presented in Table 4.
- Responses from Madhya Pradesh and DPEP states like Maharashtra and Assam show strong opinion in favour of community's control over the village school.
- In Maharashtra all the villages covered had a Village Education Committee (VEC). In other four DPEP states the percentage of villages having VECs ranged from 4.00 to 16.25 per cent. In the states of Madhya Pradesh and Orissa the percentage of villages having VECs was high, i.e. 65 and 72.5 per cent, respectively.

TABLE 3  
Opinion on the Textbooks Used by the Tribal Children

Opinion	Assam		Karnataka		Kerala		Madhya Pradesh		Maharashtra		Orissa		Tamil Nadu	
	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)
1. Are the textbooks of your children good?														
a. Mother	42.29	2.99	43.00	6.00	47.50	1.50	34.11	11.92	50.00	1.00	33.84	14.65	46.00	2.50
b. Father	49.75	4.48	46.50	4.00	49.00	1.00	38.08	13.08	47.00	1.00	42.92	4.55	51.50	
2. Do you like your textbooks?														
Children	90.09	9.43	86.03	13.97	97.08	0.83	95.13	4.24	85.95	13.22	88.60	9.65	97.46	2.10
3. Do the children enjoy reading the textbooks?														
a. Mother	44.78	0.50	38.50	10.50	38.50	10.50	32.94	13.08	50.00	1.00	15.66	33.66	44.00	4.50
b. Father	53.73	0.50	42.00	8.50	41.00	9.50	35.96	15.19	46.00	2.00	21.21	26.26	48.50	3.00
4. Do you think that textbooks used by the children are understood by them easily?														
Teacher	83.72	16.28	70.83	29.17	50.00	49.17	60.53	39.47	42.86	57.14	36.36	63.64	79.00	21.00

# EDUCATIONAL PROBLEMS OF TRIBAL CHILDREN

Opinion	Assam		Karnataka		Kerala		Madhya Pradesh		Maharashtra		Orissa		Tamil Nadu	
	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)
5. Do you understand your textbooks? Children	79.72	18.87	75.11	20.52	85.83	7.93	89.83	9.11	75.21	23.97	30.70	64.04	83.61	15.97
6. Do the textbooks suit the needs of tribal children? Teacher	81.40	18.60	93.75	6.25	75.00	25.0	76.32	23.68	39.29	60.71	90.91	9.09	92.00	8.00
Details of unsuitability	25.00		66.67				6.67		64.71				75.00	
a. Language problem														
b. Not easily understood			33.33		12.50									
c. Mistakes in textbooks	25.00				0.83									
d. Books not designed to capture children's interest	12.50													
7. Do you think that a special methodology for teaching tribal children is needed? Teacher	83.72	16.28	37.50	62.50	55.83	42.50	71.05	28.95	67.86	32.14	60.61	39.39	73.00	27.00

TABLE 4  
Questions Relating to Community Participation

Opinion	Assam		Karnataka		Kerala		Madhya Pradesh		Maharashtra		Orissa		Tamil Nadu	
	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)
1. Is the teacher concerned about the problems of the village?														
a. Mother	21.89	17.91	27.50	21.50	22.00	27.00	23.36	22.66	51.00	1.00	23.74	25.76	11.00	37.50
b. Father	27.86	17.41	31.50	19.00	24.50	25.50	30.14	21.03	48.00		11.62	37.37	13.00	36.50
2. Do you participate in any school function?														
a. Mother	20.40	24.88	5.00	44.00	23.50	25.50	9.58	36.45	45.00	7.00	17.17	32.32	11.50	37.00
b. Father	31.84	22.39	24.50	26.00	28.50	21.50	27.34	23.83	48.00		13.13	35.86	11.50	40.00
3. Do you participate in the school meetings?														
a. Mother	13.43	31.84	3.00	46.00	22.50	27.50	8.41	37.62	40.00	12.00	7.07	42.42	3.50	45.00
b. Father	26.87	27.36	9.00	41.50	26.00	24.00	25.23	25.93	47.00	1.00	12.63	35.86	4.50	47.00
4. Are you familiar with the activities of the school?														
a. Mother	7.96	7.31	12.50	36.50	20.50	28.50	12.15	33.88	42.00	10.00	6.06	43.43	0.50	48.00
b. Father	18.91	35.32	20.00	30.50	24.00	26.00	26.17	24.77	47.00	1.00	8.08	40.40	2.50	49.00

# EDUCATIONAL PROBLEMS OF TRIBAL CHILDREN

Opinion	Assam		Karnataka		Kerala		Madhya Pradesh		Maharashtra		Orissa		Tamil Nadu	
	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)
5. Do you involve community members in evaluating school/NFE centre? Teachers	48.84	48.84	0.00	10.00	4.17	90.83	34.21	65.79	39.29	60.71	15.15	75.76	30.00	70.00
6. Should the community have any control over the school in your village? Community leader	94.74	5.26	63.75	36.25	60.00	40.00	90.00	10.00	100.00		53.16	46.84	21.00	79.00
Type of control that you perceive.														
a. Supervisory	94.44		78.43		46.67		61.11		66.67			42.86	80.95	
b. Advisory	68.89		88.24		93.33		97.67		96.67			47.62	52.38	
c. Participatory	70.00		62.75		88.33		41.67		83.33			100.00	52.38	

Note : It may be noted that the total number of responses (Yes + No) does not conform to 100. In such cases, it may be understood that certain number of people have not responded.

### *Tribal Children*

- In Assam, Karnataka, Kerala, Madhya Pradesh and Maharashtra between 43 and 55 per cent of male siblings of school-going children interviewed continue to be in school while the percentage of femal siblings continuing school is marginally or significantly lower.
- Helping parents with their work/occupation, looking after younger siblings and minding the house are three most important household chores done by school-going children.
- In almost all the states high percentage of children had textbooks available to them but in case of some of the states like Orissa only 47.37 per cent children had textbooks.
- Most non-school-going children have to work at home. Helping parents is at the top of the list followed by looing after the house, minding younger siblings, collecting firewood and looking after household animals. In some cases the children have to cook at home.

### *Tribal Language*

- The multiplicity of home languages is reflected in the multiplicity of school languages as declared by parents of school-going children.
- Most eachers prefer to use or actually use the regional language in classroom interaction except in Madhya Pradesh where the responses give in favour of tribal dialect and regional language is the same.
- The results show that even those teachers, who presumably speak the same language as the learners, prefer to use the regional dominant language for classroom interaction.
- A large number of teachers believe that the textbooks should be in the standard regional language.
- Parental preference for the medium of instruction swings heavily in favour of the regional language.

## **Implications of Findings for Designing Interventions**

### *Educational Facilities*

- **Primary Schools**  
In Assam, Karnataka, Kerala, Madhya Pradesh and Orissa there is need for providing schools in all the tribal villages so far uncovered by primary schools. It may be necessary to carry out indepth studies of children who attend school in nearby villages in order to understand the motivation of such children and their parents.



- Ashram Schools  
It would be desirable to study the ashram/residential schools in Maharashtra to understand how these work. They may provide model for replication. It would seem desirable, however, to provide an ashram/residential school in all tribal villages in these states.
- Children in Ashram Schools  
There is need for undertaking indepth studies on the utilisation and relevance of ashram schools in all the states.
- Non-Government Organisations  
It is clear that more non-governmental participation is necessary for education of tribal children. All States, particularly Maharashtra, need to take concrete steps in this direction.
- Development Programmes  
The DPEP projects in these districts should look at all the available developmental programmes for linkage with education and for effective coordination amongst various agencies.

#### *Teachers of Tribal Children*

- Teacher Age and Sex  
In view of the emphasis on recruitment of female teachers under the DPEP, it would be necessary to correct the imbalance between male and female teachers in these states. Special recruitment policies coupled with adequate training programmes would be necessary.
- Teacher Qualifications  
It is possible that some of the states may continue to have a policy of relaxation of minimum qualifications for primary school teachers. If so, additional training inputs would need to be provided under DPEP.
- Teacher Training  
It is clear that states like Assam and Madhya Pradesh need to strengthen their pre-service training programmes. At the same time in-service training programmes need to be streamlined in all states specially in Kerala, Madhya Pradesh, Maharashtra and Orissa.
- Learner Attendance  
Much more data is needed on why children do not attend school regularly. Indepth studies in the DPEP districts would be of significance.
- Teacher Attitudes : Job Satisfaction  
An analysis of the teacher attitudes would show that in some of the States the teachers are quite innovative. These practices need to be studied and documented for replication.

## EDUCATIONAL PROBLEMS OF TRIBAL CHILDREN

- **Teacher Perceptions : Teaching Problems**  
While some of the perceptions can be related to physical facilities and infrastructure, others are related to learner capacities. Further study of these problems specially in states like Assam, Karnataka, Madhya Pradesh and Tamil Nadu may provide insights for training programmes for teachers in tribal areas.
- **Teacher Perceptions : Learner Problems**  
There is need for carrying out a number of indepth studies on learning achievement and learning problems of tribal children in these states.
- **Teacher Perceptions : Problems of Tribal Girls**  
It is obvious that the issue of girls' education, especially among the tribal populations, is of utmost importance. (Findings of the gender studies in these states may indicate remedial action).
- **Operation Blackboard**  
The scheme of Operation Blackboard needs to be reviewed in the tribal villages in these districts.
- **Facilities for Tribal Children**  
State schemes on incentives need to be made available universally to all tribal children.
- **Delay in Supply of Facilities**  
It would be necessary to identify all bottlenecks in the delivery of incentives and other facilities to tribal children in the DPEP districts for better coordination at the state and district levels.
- **Non-Formal Education**  
Non-formal education as an alternative delivery system would need to be dovetailed with primary education in all villages in tribal areas.

### *Teacher and School Programme*

- **Textbooks**  
The question of textbooks for tribal children must be dealt with in a comprehensive way taking into account the home language of the learner and the requirement of the school curriculum.
- **Textbook Comprehensibility**  
Individual indepth studies on most successful teaching-learning methodologies need to be carried out in all the DPEP districts. These could be linked with the tribal language and the learning strategies already acquired by children in their social settings.
- **Teaching Aids**  
State-wise assessment on availability, access to and use of teaching aids needs to be carried out.

*Tribal Parents*

- Parents' Education  
Literacy and formal education among the tribal adults all over the country needs to be examined carefully. Success of programmes for universal primary education is often correlatable with parents' education.
- Schooling of Children in Age-group 6-14  
There seems to be high correlation between attendance in Anganwadis and attendance in schools. Linkage between ECE and primary education, therefore, is of prime importance.
- Parents' Attitude towards School  
Parent satisfaction with the school system is high, yet parents' awareness of and participation in school functions is very low, except in the case of Maharashtra. Vigorous steps will have to be taken to secure greater participation of parents of tribal children in school education.
- Parents' Attitude towards Infrastructure  
There is need to educate the tribal parents about the different incentive schemes for tribal children.
- Parents' Attitude to Change  
Demand for a more relevant system of education can only emerge from greater parents' awareness and parent participation

*Tribal Community Leaders and School Education*

- School and NFE  
Community perceptions need to be discussed at the district level workshops to be organised in DPEP districts.
- Community Control  
It would be necessary to collect extensive data on actual community participation in the primary school system in the DPEP districts.
- Village Education Committee  
The formation of village education committee is an essential ingredient for UPE. This aspect needs to be looked at very carefully in all states. The existing situation in Maharashtra needs to be studied for replicability in other states.

*Tribal Children*

- School-going Children and Siblings  
A more rigorous indepth study on acceptance of primary school education by tribal families and its generalisation may be undertaken in all the states.

## EDUCATIONAL PROBLEMS OF TRIBAL CHILDREN

- Continuanace of Sibling Education  
More indepth studies in this area need to be carried out.
- School-going Children and House Work  
There is need for studying the work demands made on children, specially in terms of hours per day and timings during the day. Such information should enable education planners to provide school facilities when children are free.
- School-going Children and Wage Work  
More information on wage-earning school-going children needs to be collected from tribal areas.
- School Children and Textbooks  
Actual availability of textbooks must be recorded in all the DPEP districts. Discrepancies between sectoral responses must be understood.
- Relevance of Textbooks  
The question of textbook comprehensibility needs to be critically examined.
- Attitude towards School  
There is need to make school/NFE centre attractive for the tribal learner.
- Reasons for not Attending School/NFE Centre  
This entire area of attendance and irregularity is poorly understood and needs to be studied specially in the context of tribal children.

### Questions that Require Further Probing

As was stated above (in the Introduction), the tribal study has generated some very interesting data in each of the seven states. It is well-known that the tribal communities in the different states have characteristics that are unique to each community. The situation in Assam is vastly different from the situation of tribal communities in Orissa. For an understanding of the ground realities in each of the states presented here, the specific survey reports will have to be studied. However, the synthesis presented in this document throws up some very interesting indicators which would seem to be common to all tribal communities.

The first of these indicators of course is the issue of language. All the tribes seem to be torn between the tribal mother tongue and the regional state language. While there is a deep-seated desire on the part of the tribal communities to identify with the tribal language, most communities are aware of the obvious socio-economic significance of the regional standard language.

The other important indicator common to all state survey reports is that of an awareness about the relevance of school education for tribal children. The overwhelming opinion is that relevant schooling for the tribal children and specially for the tribal girl child is needed. The search for a viable alternative,

which is in consonance with the aspirations of the parents and the children seems to have been initiated in the various states. In this context most tribal communities investigated have asked for a curriculum which is linked to the economic activities in the local context.

It is clear that some of the basic infrastructural facilities such as school buildings, teaching-learning materials, equipment under the Operation Blackboard as well as the incentives provided by some of the states for tribal children do not reach the user population as efficiently as they should.

There is widespread understanding about the role of the school teacher in providing relevant education for the tribal children. Most of the communities prefer the appointment of local teachers who can communicate with the children in the local language. There is also a demand for adequate number of teachers for the schools.

Awareness of the relevance of non-formal education is another indicator. Even in states where there is no widespread non-formal education programmes the tribal parents are aware of the advantages of such an alternative.

The survey reports from the various states can at best be seen as sample studies since the data has been collected from a very limited number of villages in the tribal areas. However, one can generalise from the findings and plan at the district level. At the same time, there is need for carrying out quick surveys and research studies in order to validate some of the findings, as well as to acquire a better understanding of the educational needs of these tribal communities. On the basis of the comparison carried out in this document the following studies may be undertaken in different states:

1. A study to determine the efficacy of the ashram school
2. A study of successful on-going school programmes in tribal areas to help planners in providing relevant inputs
3. A study on factors promoting or inhibiting learner attendance.

#### NOTES

##### *Investigators' Diaries and Focussed Group Discussions*

Each of the seven states, where the tribal study was conducted, was required to submit a status report and a survey report. Status reports and survey reports have been completed in all the seven states.

In each of the survey reports the state team was required to summarise the observations of the investigators' daily diaries. These diaries were maintained by each investigator in which his/her observations regarding the actual socio-economic and educational situation in the various villages were to be recorded. It was felt that such observations would provide significant and rich data. Investigators' diaries, which are in the regional languages, were then analysed by the State Coordinators and an account of the major observations has been included in each survey report.

In each of the villages surveyed the investigators were also required to hold a focussed group discussion with the community leaders, parents and teachers. A record of these discussions was also maintained by each investigator. These records are also in the regional languages. A summary of the discussions in the focussed groups has been provided in each survey report.

## EDUCATIONAL PROBLEMS OF TRIBAL CHILDREN

Here an attempt has been made to list the salient features of the investigators' diaries and the focussed group discussions given in the individual survey documents. No attempt has been made to draw comparative conclusions on the basis of these salient features, since every state has unique situations and problems.

### ASSAM

#### *Investigators' Diaries*

Analysis of the field investigators' diaries from Assam brings out the following points:

- The areas selected for the study are dominated by the scheduled tribe populations. Among all the tribal populations, Bodo is the most dominant tribe. The members of this tribe speak Boro. Since 1963 this language has been used as the medium of instruction in all the Bodo schools.
- The main occupation in this area is agriculture and the main source of income is from agricultural products. Besides this, a number of members of the community work on daily wages as rikshaw-pullers, labourers, etc.
- Though a number of development schemes were meant for rural areas, they have not been fully implemented. Basic facilities like electricity, irrigation, water supply, public health provisions are not available to all the villages.
- People belonging to this community were very warm and extended full cooperation to the investigators. The Bodo community as a whole has a very positive attitude towards education. But it was observed by the investigators that parent "unawareness about education is an important reason for poor enrolment of ST children in primary schools.
- In almost all the villages, the village Pradhan or the headman of the community extended full cooperation and support to the study.
- Most of the schools covered by this study were in good condition but some school buildings needed repairs. Almost all the schools have been covered under the Operation Blackboard scheme, but the materials provided under the OB are yet to be properly used. In some of the villages of Darrang district there are some NFE centres and Anganwadis. NFE centres in this area have to be activated so that the community can derive maximum benefit.

#### *Focussed Group Discussions*

Due to politically disturbed situation in the state, focussed group discussion could not be held in all the 20 villages. Individuals from all the sections of the community, viz., parents, teachers, community leaders, Anganwadi workers, political workers and political activists participated in the meetings. All these participants expressed their desire for getting education for their children. While doing so they showed their disappointment over the functioning of NFE and Anganwadi centres and complained about the non-availability of textbooks and other incentives to their children in time. All villagers were very keen to have basic knowledge about health, sanitation hygiene and child-care and wanted Anganwadi centres to impart it to them. Many parents and Heads of the villages and other members of the community did not have any knowledge about various incentives provided by the government for their children. Some of the points emphasised by them for development of primary education in their villages were as follows:

- Need for improvement of school buildings
- Need for increasing the number of teachers in the school
- Timely supply of textbooks
- Training for teachers
- Timely monitoring of schools by educational administrators

## EDUCATIONAL PROBLEMS OF TRIBAL CHILDREN

- Provision of mid-day meal, free uniform and supply of sports items for children
- Need for making the school curriculum suitable for the needs of their children
- Extension of Operation Blackboard scheme to all the villages.

### KARNATAKA

#### *Investigators' Diaries*

Analysis of investigators' diaries brought out the following points:

- Devadurga block has sufficient number of primary schools
- More school buildings along with more teachers and sufficient teaching materials are needed in the area
- Schemes aimed at tribal development have not reached the needy people. The block faces acute shortage of drinking water facilities. Therefore, girl students have to fetch water from long distances which results in their being absent from the school very frequently.
- Community leaders complained about irregularity of teacher attendance and also talked about their habit of coming late to the school
- Teachers give corporal punishment to tribal children for not coming in clean clothes but it was not mentioned openly by the community leaders
- In general the members of the tribal community did not have any knowledge about developmental schemes and facilities provided for tribal children
- Tribal community members were not interested in educating their children. The reason for this in their opinion was that children get less opportunities of work after receiving education.
- Some parents wanted separate educational system for their girls. They felt that a lady teacher will be the most ideal teacher for their daughters and their girls should get training in house-keeping. The benefits of incentive schemes do not reach the recipients in proper time. Most of the students were found without proper clothing and books.
- Distribution of milk among tribal children under an incentive scheme of the Government of Karnataka is being misused.
- Anganwadi centres in the states have not attracted tribal parents to send their children to them
- The size of the family in the tribal communities of Karnataka was big, i.e., about 5-8 children per family
- Members of the community felt the need of NFE system and wanted to send their children to NFE centres. They thought that the timings of NFE centre will be more suitable than the timings of schools
- Linkages between Balwadis and primary schools need to be established.
- Need for health facilities for tribal people was strongly felt.
- Community leaders said that incentives should reach the clientele in time. The teaching in the school should be made more attractive and more job-oriented courses should be included.
- Financial assistance should also be provided to tribal children for their upliftment.
- Basic facilities like electricity, roads, drainage, etc. were not available to the tribal community of this area

#### *Focussed Group Discussions*

Some salient observations made during the focussed group discussions are as follows:

- Mid-day meals given to Anganwadi children are a great attraction for children.
- To make primary education attractive, it could be clubbed with Anganwadi centres.

## EDUCATIONAL PROBLEMS OF TRIBAL CHILDREN

- A need for more ashram schools was expressed. It was also demanded that NFE centres with proper facilities may be opened in the state. Since there was a shortage of teaching-learning materials, the community felt that the government could give some grant to the Panchayat to provide teaching-learning materials.
- Educational activities could be transferred to the Panchayat. There was a strong resistance against transfer of teachers from urban areas to rural and tribal areas because they do not understand the culture of rural and tribal areas.
- Villagers also expressed their need for health centres, agricultural facilities and digging of wells for irrigation.

On the analysis of investigators' diaries and group discussions and close observation of the areas, the following are recommended for tribal education in Karnataka:

- Proper awareness campaigns should be organised to make the tribal community aware of the importance of education.
- To bring the tribal children to the mainstream the curriculum should be modified according to their culture, dialect and local environment.
- Preference should be given to the local teacher at the time of selection.
- School environment should be made more attractive.
- Some of the problems of tribal education which need to be addressed are: poor economic condition of the tribals, poor management system of education, language problem and lack of interest on the part of tribal community in education.

## KERALA

### *Investigators' Diaries*

Analysis of investigators' diaries brought out the following points:

- Most of the tribal people are illiterate.
- Most of them live in the forest areas and hence earn their livelihood from the forests. Deforestation has had an adverse impact on their economic condition.
- Addition to liquor is one of the major causes for their bad health. They are often struck by epidemic diseases.
- Being illiterate the parents are not aware of the importance of education and hence are not interested in sending their children to school. This attitude may be due to poverty.
- Children are scared of corporal punishment.
- For higher education, children have to travel long distances.
- In some schools both the headmaster and the teachers were found to be irregular. They came at their own will.
- Lack of learning facilities and insufficient number of teachers.
- Though students are irregular the teachers mark their attendance so that the children do not lose their stipend.

### *Focussed Group Discussions*

Some of the opinions expressed during the focussed group discussions are as follows:

- Community members and village heads are very interested in the education of the tribal children while most of the parents are not interested in the education of their children.
- Community leaders and members demanded more tribal girls' hostels.
- A need for a joint effort of the people for compelling the parents to send their children to school.
- Grants should be increased in order to provide books, clothes, etc.
- No special education system is required for the girls.



## EDUCATIONAL PROBLEMS OF TRIBAL CHILDREN

- In Wayanad district some community leaders felt the need for Tribal Officers who will work for the development of the tribal people by understanding their problems and finding proper solution to them.
- Instructors may be appointed for conducting tuition classes and for enquiring into the reasons for irregular attendance by children. The findings, they felt, should be reported to the Tribal Officer.
- Most of the tribal schools are not functioning well
- Hostel facilities, free boarding and lodging should be provided to the tribal children
- Representatives of the scheduled tribes should be invited to form a part of the P.T.A Committee
- P.T.A. Committee meetings must be held at least once a month.
- Teachers are irregular in attending the school.
- Primary health centre is essential.

On the analysis of investigators' diaries and group discussions the following steps may be taken for the development for tribal population in Kerala:

- 1 To organise special schemes for their development.
- 2 Parents should be given permanent jobs.
- 3 To attract the illiterate parents to the literary centres.
- 4 To assign sufficient quantity of cultivable land to them.
5. To conduct awareness classes for them
6. Create volunteer organisation for them.
7. Schools may be started very near to tribal habitations. Local teachers may be appointed there.
8. Parents must be asked to come to the school once in a month.
- 9 Education officers must visit the school once in every three months and give advice for the upliftment of the school
10. The Tribal Officers should be instructed to get all the school-aged children enrolled in the nearby school
- 11 To simplify the textbooks.
- 12 To create affectionate atmosphere in school and change the teaching-learning process into joyful activities.

## MADHYA PRADESH

### *Investigators' Diaries*

After the analysis of the investigators' diaries the following points emerged:

#### *Atmosphere and Economic Status of the Village*

- The majority of children belonging to the age-group 6-14 is engaged in agriculture work as labourers. The tribal people are very poor therefore they are unable to send their children to the school.
- Drinking alcohol is a common evil in tribal areas. Discriminating between a girl child and a male child is prevalent in this area. In general parents are not interested in getting their daughters educated.

#### *Community and Culture*

- Most of the children believe in evil spirits and have faith in magic, like their parents.
- The tribals influenced by Christian missionaries are more developed than other tribal communities.

## EDUCATIONAL PROBLEMS OF TRIBAL CHILDREN

### *Dialect of the Survey Area*

Most of the tribal parents and children speak their own dialect such as Kanaku, Kanwar, Gondi, Baiga, Korku and Bhili. Therefore, most of the children do not understand the Hindi language at all. Even literate tribals speak their own dialect in their houses. About 90 per cent Korku tribals speak the Korku dialect.

### *Educational Situation*

- School buildings are in very poor condition. Even basic facilities are not available in these schools.
- Behaviour of the teachers with tribal children in the school is not friendly and sympathetic at all.
- The number of teachers in various schools needs augmentation.
- The village Panchayat does not have effective control over the educational atmosphere of the village.
- The supervision in the school is not satisfactory. The negligence of the supervisory staff in the area of primary education has made the situation even worse.

### *Views of the Community Leaders*

- Due to famine and drought in the state, tribal people migrate from one place to another as a result of which education of their children suffers.
- Many heads of the villages expressed that children have to walk long distances to come to the school. Therefore, in such situations more schools should be opened.
- There is a lack of drinking water facility in most of the schools.
- Panchayat is headed by illiterate and inefficient people which affects the functioning of Village Education Committee (VEC). In such situations VEC does not have any control over educational and developmental activities of the area.

### *Focussed Group Discussions*

During the focussed group discussions organised by the project staff, the following points emerged:

- In the areas selected for the study, Anganwadi activities were more effective than primary school activities. The meals given to children at Anganwadi centres are great attraction for children.
- NFE centres should be made more effective and equipped with more facilities.
- Most of the schools feel shortage of teaching-learning materials at all times. It has been suggested that the government should provide some grant to Panchayat to purchase this material.
- Educational activities should be transferred to the Panchayat. Local people should be oriented as teachers. Teachers coming from urban areas should not be posted in schools in tribal areas because they do not behave well with the tribal people.
- Villagers demanded a health centre and agricultural facilities in the village.

On the basis of the above points, a few recommendations have been made in Madhya Pradesh which are as follows:

- Since tribal people do not give any importance to education, proper awareness campaigns should be organised for them.
- To make schools more attractive for tribal children their social and cultural values should be given proper place in their curriculum.
- Preference should be given to local persons at the time of appointment of teachers.
- School environment should be made more attractive.

## EDUCATIONAL PROBLEMS OF TRIBAL CHILDREN

- Suitable inspection and supervision system should be developed.
- Educational activities should be transferred to Panchayats.

### MAHARASHTRA

#### *Investigators' Diaries*

The analysis of field investigators' diaries bring out some very interesting observations which are as follows:

- Most of the tribals in this area are very poor and ignorant. The relationship within the family is not very sound.
- There is no hospital in any of these villages. Only a health worker resides in the village.
- Basic facilities like drinking water and electricity are not available to local communities.
- The condition of the school buildings is very poor.
- Both Anganwadi centres and primary schools are functional in most of the villages.
- Most of the tribal people are engaged in work as daily wagers and collect forest produce. The average number of children in a tribal family is 4 to 5.
- Most of the primary schools have two teachers.

#### *Focussed Group Discussions*

The conclusions drawn after analysing the focussed group discussions are as follows:

- Most of the children in the age-group 6-14 attend school.
- The drop-out rate is very low.
- Both teachers and students have to struggle with the issue of tribal dialect versus sante language.
- Children have to work as household workers to earn their wages.
- Neither uniforms nor other materials are provided to children in the age-group 6-14.
- There is shortage of teaching-learning materials in the schools.
- Girls have to do household work and look after their siblings at home.
- Village Education Committees are functional.

### ORISSA

#### *Investigators' Diaries*

The analysis of the field investigators' diaries brings out the following:

- Poor financial condition of tribal people is the main reason for children not attending school.
- The community felt a need for free food, clothing and supply educational materials from the government.
- Most of the children help their parents in agricultural work and other household activities.
- Most of the schools have poor infrastructure and unhealthy atmosphere.
- Tribal children are unable to understand the regional language, i.e., Oriya. Teachers' bookish language is not easily understood by tribal children.
- Most of the tribal people speak their own dialects.
- Members of the community demanded NFE centres and Anganwadis.
- Due to the expenditure involved parents usually do not take any interest in sending their children to the school.
- In general, enrolment of girl students is very low in the selected villages.
- Children have many health problems resulting from polluted water, unhealthy atmosphere and dirty habits. During the study no health worker was ever found to be in the village.

## EDUCATIONAL PROBLEMS OF TRIBAL CHILDREN

- Most of the tribal people are addicted to alcohol and drugs
- Most of the people of these villages have negative attitude towards an educated person. They very strongly felt that a number of studies were conducted in their villages by various agencies but nothing concrete was done for them.
- People were aware of their exploitation by local contractors.
- Primary school teachers and NFE instructors are irregular in attending schools and NFE centres. They also remain absent for a very long time
- Non-tribal teachers and other people discourage tribal parents from sending their children to school. They also look down upon the tribal customs, culture, dress and language. This creates a feeling of inferiority among the tribals. Parents complained against teachers, saying that the teachers were addicted to liquor and play cards during their working hours.
- Supervision system in the selected blocks is very weak.
- Some parents are interested in getting their children educated through the English medium.
- Most of the girls in the age-group 6-14 are engaged in looking after animals like goats, pigs, etc., and take care of their younger brothers and sisters. They also help in household work. The health of girls in the age-group 6-14 was very poor.

### *Focussed Group Discussions*

Some observations made during the focussed group discussions were as follows:

- Due to lack of awareness about the importance of education and prevailing poverty, enrolment of tribal children in schools is very low
- In some of the villages the school buildings are not in good conditions and the classrooms have very unhygienic conditions.
- Teacher absenteeism and ineffective supervision of schools hampers smooth functioning of school
- There is a lack of teaching-learning materials and teaching aids and other materials. The timings of the school do not suit children and their parents
- In some cases teachers discourage tribal children from coming to the school.
- The language of the teacher is not intelligible to tribal children. Also, teachers coming from outside do not have any knowledge of the local tribal language. Both parents and teachers in general maintained a distance from each other.

Some suggestions given by tribal parents and community leaders for improvement in education are as follows:

- Education officers, supervisors and inspectors should make regular visits to the school.
- Teachers interested in educating tribal children and also having knowledge about local tribal language should be posted in tribal areas.
- More incentive schemes should be introduced for tribal children. These schemes may include free meals, free uniforms, learning materials, etc
- Educated tribal youth should be recruited as teachers and posted in tribal areas
- Timings should be revised to suit the girl students
- More ashram schools may be opened in the villages having high tribal population.
- More women teachers should be recruited which will facilitate education of tribal girls.

## TAMIL NADU

### *Investigators' Diaries*

The following facts have emerged from the analysis of investigators' diaries and focussed group discussions:

## EDUCATIONAL PROBLEMS OF TRIBAL CHILDREN

- The total literacy rate of tribal population in this area is 50 per cent with female literacy as 42 per cent and male 58 per cent.
- Socio-economic status of tribals of this area is low.
- Nearly 30 per cent of the children in the age-group 6-14 are employed as domestic workers and daily wagers
- Due to financial constraints tribal people are unable to send their children to schools.
- Tribal people prefer more residential schools to regular primary schools. This may ensure effective monitoring of development of their children by the teachers.

# EDUCATIONAL PROBLEMS OF TRIBAL CHILDREN

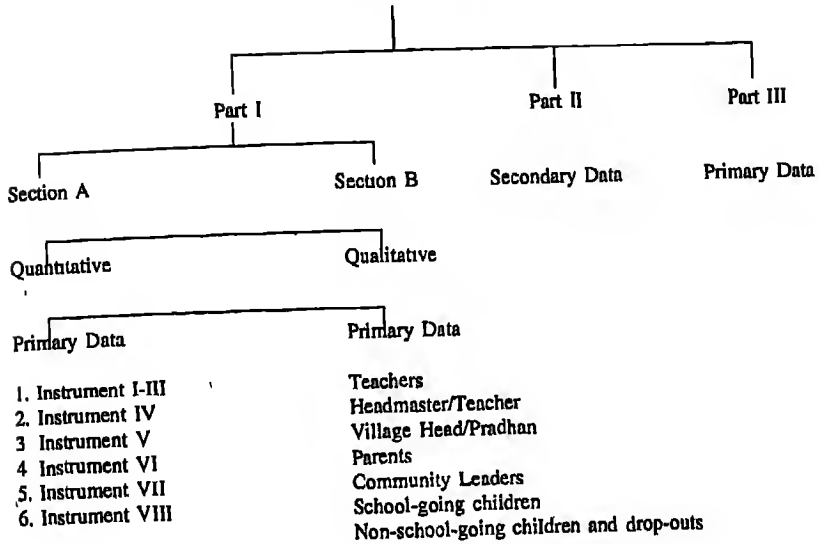
## ANNEXURE

### Tribal Population in DPEP Districts

<i>States</i>	<i>Districts</i>	<i>Name of the Blocks</i>	<i>Percentage of Tribal Population</i>
Assam	1. Darrang	Udalguri	20.16
	2. Dhubri	Chapar	41.73
	3. Morigaon	Bhurbandha	30.14
	4. Karbi Anglong	Howraghat	39.94
Karnataka	1. Belgaum	Gokak	6.89
	2. Kolar	Bangarpet	15.19
	3. Raichur	Devadurga	20.16
Kerala	1. Kasargode	Kasargode	4.30
	2. Wayanad	Mananthavady	19.83
Madhya Pradesh	1. Betul	Bhimpura	83.79
	2. Rajnandgaon	Nanpur	74.85
	3. Satna	Ram Nagar	24.79
	4. Rewa	Hanumana	19.65
	5. Panna	Shahnagar	28.68
	6. Chattarpur	Byawar	13.51
	7. Tikamgarh	Jatara	9.57
	8. Ratlam	Bajana	91.02
	9. Mandsaur	Jawad	15.02
	10. Dhar	Bagh	88.36
	11. Guna	Bamori	27.65
	12. Sihor	Narrulaganj	29.97
	13. Raisen	Silwani	33.64
	14. Rajgarh	Pachor	7.70
	15. Bilaspur	Pondhupura	73.10
	16. Raigarh	Kansaval	82.50
	17. Shahdol	Pushprajgarh	78.31
	18. Sidhi	Kusmi	64.71
	19. Sarguja	Batauli	77.68
Maharashtra	1. Nanded	Kenwat	31.92
Orissa	1. Kalahandi	Thuamul	55.65
	2. Phulbani	Udayaguri	63.99
	3. Gajapati	Rayagada	77.89
	4. Rayagada	Kolnara	68.75
Tamil Nadu	1. Dharmapuri	Pippireddipatti	18.24
	2. South Arcot	Olakkun	13.68
	3. Thiruvannamalai	Jawadhu	61.89

# EDUCATIONAL PROBLEMS OF TRIBAL CHILDREN

TABLE I  
Tools Description  
Instruments (Eight)



# Gender Issues in Primary Education

USHA NAYAR

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## ABSTRACT

*The present study looks at gender sensitive project planning and implementation, increasing number of school for girls — both formal and non-formal—improving support services for girls and increasing the number of women functionaries in education, making the content and process of education gender bias = free and building positive self-image among girls, sensitizing educational personal and community, monitoring progress of gender equality, social mobilization etc. leading to a society where being a man or woman does not work as advantage or disadvantage to a person. Based on various findings, the paper suggests suitable programme interventions in different areas.*

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## Gender Perspective in National Policy on Education

The National Policy on Education—1986 is a major landmark in the evolution of the status of women in India. The NPE goes substantially beyond the equal educational opportunity and social justice (equity) approach and expects education to become an instrument of women's equality and empowerment. Paras 4.2 and 4.3 of the NPE put the issue of women's equality on centre stage :

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The present study has been taken from the document *Research Based Interventions in Primary Education : The DPEP Strategy* (1994) National Council of Educational Research and Training, New Delhi



Education will be used as an agent of basic change in the status of women. In order to neutralise the accumulated distortions of the past, there will be well-conceived edge in favour of women. The national education system will play a positive, interventionist role in the empowerment of women. It will foster the development of new values through redesigned curricula, text-books, the training and orientation of teachers, decision-makers and administrators, and the active involvement of educational institutions. This will be an act of faith and social engineering. The women's studies will be promoted as a part of various courses and educational institutions encouraged to take up active programmes to further women's development.

The removal of women's illiteracy and obstacles inhibiting their access to, and retention in, elementary education will receive overriding priority, through provision of special support services, setting of time targets, and effective monitoring. Major emphasis will be laid on women's participation in vocational, technical and professional education at different levels. The policy of non-discrimination will be pursued vigorously to eliminate sex stereotyping in vocational and professional courses and to promote women's participation in non-traditional occupations, as well as in existing and emergent technologies.

The Programme of Action (POA) as revised in 1992 clearly spells out the need for the entire educational system to be alive to gender and regional disparities. Gender sensitivity is to be reflected in the implementation of educational programmes across the board. The POA makes it incumbent on all agencies and institutions in the field of education to be gender-sensitive and ensure that women have their rightful share in all educational programmes and activities. To this effect all educational institutions have to plan and act. All educational personnel, therefore, need to be sensitised on gender issues.

### **Sex and Gender**

There is gradual realisation that men and women play an overlapping variety of roles which complement one another. A change for one inevitable brings a change for the other. A balanced gender-aware approach would be the best way to implement development programmes. Whereas sex is biologically determined, gender imputes values to biological differences. One is born female or male but it is one's culture which makes one masculine or feminine. Gender is thus the cultural definition of behaviour defined as appropriate to the sexes in a given society at a given time. Gender roles are hard to change but as they are socially/culturally created, they are changeable. Gender roles are a learned behaviour. These roles in their social, economic and political dimensions vary across cultures and are internalised very early in life. There is non-conscious internalisation of

the gender role ideology during early childhood and education does little to modify or change this. In fact, education further strengthens the familiar gender-based division of labour and resources through inequitable distribution of school resources and a gender discriminatory transaction of the curricula. The main actors of gendering in school are the teachers, the educational planners and administrators, the curriculum developers and the textbook writers. And, they all emerge from the same society and have internalised (unequal) gender roles. It is only after unlearning some of the prejudices and stereotypes that an administrator, or a textbook writer can become a source of women's empowerment or gender equality. The POA recommends that :

- (i) All teachers and instructors will be trained as agents of women's empowerment. Training programmes will be developed by the NCERT, NIEPA, DAE, SRCs, DIETs, SCERTs and the university system. Innovative training programme will be designed with the assistance of concerned organisations and women's groups.
- (ii) The common core curriculum is a potentially powerful instrument to promote a positive image of women. The Department of Women's Studies, NCERT will intensify activities already initiated in the area of developing gender-sensitive curriculum, remove sex-bias in textbooks and training of trainers/teachers. SCERT and concerned state level boards and institutions will initiate similar work

In the area of girls' education and women's empowerment, significant research and development work was done for operationalising NPE commitment to education for women's equality after 1986. Considerable data-based analysis pointed to the educational and social lag of women and girls *especially those belonging to rural areas*. The most significant contribution of these field-based empirical studies was to highlight the regional and gender disparities and help in identifying districts which were backward in female literacy and schooling. This formed the basis for girls/women focussed EFA strategies and so the Eighth Five Year Plan (1990-95) focusses on issues of rural girls and women from disadvantaged groups.

The 1980s were a significant period when issues of sex-bias in curriculum and its transaction were raised and tools were developed to analyse textbooks and other learning materials from the point of view of gender equality and later from the angle of women's empowerment. This was also a time when teacher education curriculum was reviewed from gender perspective.

Several EFA initiatives have been taken in the 1990s to include Bihar Education Project, Andhra Pradesh Primary Education Project, Uttar Pradesh Basic Education Project, Lok Jumbish in Rajasthan and Total Literacy Campaign (TLC) in more than 200 districts, *with focus of girls' education and women's empowerment*. The experience gained in these on-going projects has been utilised

in formulating one of the largest primary education programme, namely, the District Primary Education Programme (DPEP).

Against the backdrop of policy commitment and the educational and social lag of women and girls, gender studies were taken up in 40 districts of the States of Assam, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra and Tamil Nadu. These were primarily low literacy districts or districts where TLCs have been taken up.

## **Goals of Gender Studies**

### *Immediate Goals*

- Gender-sensitive project planning and implementation.
- Increasing number of schools/places for girls' formal/non-formal education.
- Improving infrastructure and support services for girls and increasing number of women teachers and women administrators.
- Making the content and process of education gender-bias-free, highlighting elements to build a positive self-image and self-confidence among girls.
- Gender sensitisation of all educational personnel, parents and community.
- Monitoring progress towards gender equality.
- Social mobilisation, awareness generation, consciousness raising, advocacy, campaigns for survival, protection and development of the girl child education as a key input
- Energising existing women's groups.
- Organising new groups.
- Supporting action by women and community to promote girls' education and to raise status of women.
- Reconstruction and deconstruction of gender roles according to present and future requirements.

### *Long-term Goal*

- When being a man or a woman works neither to the advantage nor to the disadvantage of a person.

## **Objectives**

1. Mapping out gender disparities in access, enrolment and retention.
2. Identifying causes for non-enrolment and drop-out of girls and propose effective districts/local-specific strategies for improved enrolment, retention and achievement among girls.

3. Assessing the situation of women in each district with regard to some social and demographic indicators and women equality and empowerment.
4. Collecting information on gender-bias in (a) textbooks, (b) teacher training, (c) teacher attitude, (d) transaction, and (e) administrators' attitudes.
5. Identifying supportive community structures such as women groups, VECs, Panchayats, PTAs, teacher organisations, youth clubs for developing effective strategies of UPE among girls.
6. Identifying ways of facilitating convergence of services of different departments for UPE among girls (ECCE health and support services).
7. Studying the availability of educational (books, stationery, uniforms) and other incentives (noon meals, attendance prizes, etc.)
8. Assessing participation of women in teaching, administration and other decision-making bodies.
9. Developing state/district level monitoring and framework for removal of gender disparities.

### Earlier Studies

The girls suffer from abnormally high incidence of dropout. In fact a large majority of them consist of pull-outs who are pulled out of the educational system by sheer force of socio-economic and cultural compulsions. Then, there are educational factors, like irrelevance of curriculum, discriminatory attitudes of teachers, parents and community regarding the value of education particularly to girls who are forced to quit without completing the primary stage of education.

The situation among rural girls was found to be much worse in 1976. According to a national study conducted in 13 major states, the drop-out rate for girls in rural areas was 65.6 per cent compared to 22.3 per cent in urban areas. The high rate of drop-out of rural girls was 52 per cent compared to 44 per cent for urban girls (NCERT, 1976). This study reflected that there were more repeaters than premature withdrawals contributing to the overall drop-out in a particular batch. Further, the high rate of drop-out was more in earlier classes, i.e. between Class I and II and the enrolments stabilised in later classes. It was also found that states in which the primary stage constituted Classes I-IV the drop-out of girls was very high, and was higher among the rural girls.

### *Reasons for High Drop-out of Girls*

Reasons for high drop-out among girls given by the parents, the community, the girls themselves and the educational practitioners are poverty, early marriage, helping parents with house work and agricultural work, unattractive school environment, parents' illiteracy and indifference, lack of a positive educational climate, neglect of studies leading to repeated failure and finally

withdrawal from schools. Girls join very late and are withdrawn at the onset of puberty. Parents do not see any benefits of girls continuing in school and are in a hurry to marry them off so that their liability is shed

Findings of a national study (NCERT, 1993) show a striking difference in the self-perception of girls who stay at home and the drop-outs, the former had a relatively higher self-image and a supportive family environment by and large. There were, however, cases where girls showed great determination and were doing well in spite of several odds. By and large, drop-outs were from relatively poorer households who may initially register the girls in school but later withdraw them on account of economic compulsions of work at home and many times on account of lack of clothes and extra tuition costs. Girls, when they do not fare well repeatedly, are withdrawn whereas boys are made to continue. Girls get much less time for studying at home, and leisure and play are remote events in their lives. Boys have the liberty to play and even while away their time as it is considered natural that they are playful.

It may be pertinent to point out that though enrolment ratios of girls in primary and upper primary are very high in the North Eastern states and tribal regions, the drop-out rates of girls are equally high and field studies and field observations show that though gender discrimination is not prominent in other aspects like food, health, personal freedom, girls are held back for working on the fields and looking after animals and little use is seen by the parents to give formal education to them.

### *Reasons for Low Enrolment of Rural Girls*

The reasons assigned for non-enrolment of rural girls are a combination of educational and extra-educational factors, where low and inadequate provision (supply) compound the socio-economic disadvantage of rural girls :

- (i) Low access and provision of educational facilities.
- (ii) Lack of adequate support services of child care, medical and health care.
- (iii) Lack of access to convenient sources of water, fodder and fuel.
- (iv) Low female literacy and associated low status of women.
- (v) Low parental education and apathy to education of daughters.
- (vi) Low valuation of female life itself and discriminatory attitudes towards female child in access to food, health care, education and leisure.
- (vii) Early marriage of girls hinders their educational chances.
- (viii) Keeping poverty as constant, in poorer households the burden of male unemployment is passed on to women and children, particularly girls. Daughters attend to domestic chores and sibling care. Hence, they either do not join school or drop out. This trend will continue unless employment is assured for one adult.

- (ix) Girls and women's work is considered interchangeable not boys' work and hence the perceived opportunity costs for girls are higher than those for boys (Chamie, 1982:32). Another study shows that a 10 per cent rise in female wages reduced school attendance of girls by 5 per cent.
- (x) Girls in poorer families labour pool significantly improve the amount of schooling which male children receive.
- (xi) The large size of poverty households is a deterrent to female education, as girls from such households are required at home for sibling care and for domestic work, in addition to helping the parents on family farms and household industry/labour.
- (xii) However, the number of female children enrolled in schools, rise within the levels of household income (Shrestha, 1983; Nayar, 1988; Khan, 1989), parental education, especially father's education (Shah, 1989), and the size of land holdings
- (xiii) A recent study has found a positive relationship between the per capita household expenditure (PCHE) and performance of children at school. With the increase in PCHE, the enrolment of girls catches up fast. The enrolment rate for girls and boys equalises when the average per capita household expenditure is of Rs 225 per month.

### Methodology

The study is primarily qualitative and was carried out in participatory research mode. The concerned communities, parents, officials and researchers met together in face-to-face interaction and discussed the major issues of continuance, discontinuance and non-enrolment of girls in primary education. Structured individual interviews and group discussions were carried out in addition to secondary data obtained from the state, districts, block and sample villages. Field observation was employed to support/strengthen data obtained from secondary sources and through individual/group discussions.

In rural and urban slum settings, there is hardly any concept of household privacy. Household interviews in villages and urban slums were a family/community affair. Each interview turned into a mini discussion group with the male household head as chief respondent but household women, mother, wife, daughter, all participating. The responses registered are to be seen as parental responses as both male/female parents or occasionally a grandfather or a grandmother had their pieces to say, neighbours did not stay away either. When the investigators moved to the next identified household, the previous household head would usually accompany. In a little while it would seem that the research team was heading a small procession.

It would be pertinent to state that the group discussions were consciously conducted responses were elicited from all present, women had their full say. This compensated for male dominance of household interviews, where men felt as heads of households, it was their prerogative to give information.

### *Secondary Data*

The secondary data was collected on the following variables:

- Social and demographic indicators, population distribution by sex, rural-urban areas, sex ratio, age-specific population, especially for age-group 0-6 and 6-11 years, population density, age-specific mortality rates, infant mortality rate, child mortality rate, age at marriage by sex, child labour, work participation rate by sex, by main and marginal workers and by rural/urban areas, wherever possible.
- Literacy by sex, rural-urban, SC/ST 1981, 1991.
- Availability of primary schools/NFE Centres, ECCE Centres within walking distance of 1 to 1.6 km for girls.
- Availability of educational and other incentives like books, stationery, remedial teaching, uniforms, noon meals and attendance scholarships.
- Enrolment by sex, rural-urban, SC/ST.
- Drop-out by sex, rural-urban, SC/ST.
- Total number of teachers by sex, rural-urban, SC/ST.
- Women teachers as percentage of total teachers.
- Women's participation in terms of percentage in educational administration and other decision making bodies like Panchayats and VECs.
- Supportive structures such as ECCE (Anganwadi, Balwadi, pre-schools), women's groups (Mahila Mandals, Mahila Samakhya, NGOs, etc.); VECs, PTAs, Panchayat Education Sub-committees, teachers' organisations, Nehru Yuvak Kendras (youth clubs).
- Schemes and programmes of education departments and other departments (GOI and state governments) for girls' education and women's development.

### *Primary Data*

The primary data was collected through group discussions, field observation and interviews with parents, teachers, administrators, community leaders and dropout and never-enrolled girls themselves. The purpose was to identify :

- Reasons for continuance of girls in schooling.
- Reasons for discontinuance of girls from schooling.
- Reasons for non-enrolment of girls.

- Perceived utility of girls' education.
- Perception of gender equality and gender discrimination.
- Proposed strategies for UPE of girls' and women's empowerment.
- Role of parents, community leaders, administrators and teachers in UPE for girls.

### *The Sample Design*

The districts selected under the SSN project are low female literacy—districts. Originally, it was proposed to conduct gender studies in two blocks—one with relatively high female literacy and the other with low female literacy rate. Later, on the advice of the national core group, it was decided to select one of the baseline survey block for gender studies keeping the number of sample villages the same. In each block eight villages were to be selected for collection of primary data to represent . (a) villages having no school, (b) villages having a primary school only, (c) villages having middle school, (d) villages having secondary or higher secondary school.

In addition to the above, one/two urban slum communities were also selected for collection of primary data. This was not followed uniformly. For instance, Karnataka used different criteria for selecting these villages in each of the four districts. Assam stuck to the original plan of selecting four villages from two blocks.

### **Major Departures**

The study is innovative in several dimensions such as :

- Household was used as the entry point instead of the schools.—  
The phenomena of drop-out and non-enrolment of girls were studied separately.
- Since the education of girls is inextricably linked with the immediate socio-economic and cultural context, the study adopted the anthropological method of taking village as a unit of study. As it is well established now primary education really belongs to people, and should be their concern, each villager needing to develop a stake in its implementation. These village studies have followed the holistic intersectoral and multi-disciplinary framework.
- They provide location-specific analysis and intervention strategies, taking into account the interactive social structures and the development infrastructure, as it impinges on education.
- Instead of a team of educational researchers only, the study was an interactive process among (a) persons from various disciplines like



sociology, social anthropology, women studies, education, zoology, political science, home science, economics, psychology and statistics; (b) practitioners like Education Commissioner, SCERT faculty, Director, Primary Education, DIET personnel, District Primary Education Officer, Block Education Officers, head teachers and teachers; (c) users, e.g. community leaders, parents, women and girls and deprived groups.

The study was process-oriented, change-oriented and people-oriented. The net result has been the achievement of common perceptions and commonality of action. It now provides a framework for action by policy planners, administrators, teachers, teacher educators and the community.

### **The Process of Capacity Building**

One of the objectives of DPEP is *capacity building* and creating a culture of field research. The National Core Group Gender (NCGG) met in a workshop to discuss the proposal for gender studies from 1-3 June 1993. The proposal was sent to MHRD on 4 June 1993.

The NCGG strengthened itself. Each NCGG member who had the responsibility of looking after a state fully participated in selection and training of project personnel. He/she was accompanied by two/three members of NCGG team. Project Director participated in all the training programmes and introduced the concept and method of DPEP, gender equality and gender studies. She also met senior state/district officials for seeking their support and participated in the field work in several districts. One consultant and six professional assistants were appointed to assist NCGG. The professional assistants were oriented on the concept and modalities of DPEP at NCERT during the last week of September 1993. They were trained in the methodology of collecting data from secondary sources. Each one of them was assigned one state for detailed study on educational and other indicators. They were exposed to the seven interview schedules, individual and group interviews, techniques and methods of field observation for collection of primary data. Along with all the NCGG members, state coordinators (gender studies) participated in the review of schedules and development of coding and tabulation plan.

The Department of Women's Studies had earlier conducted a national study on factors responsible for continuance and discontinuance of girls in the schooling with focus on rural, SC/ST, and urban slum populations. The schedules used in that study were modified after field-testing in some locations. The revised project proposal was sent to MHRD on 29 June.

An orientation programme for coordinators of the project from the DPEP states was held on 8 and 9 July. The participants modified the schedules. State coordinators were also requested to identify their teams of researchers and prepare a status paper.

A national workshop on 'Elimination of gender bias from textbooks and providing inputs into primary teacher education curriculum' was held from 25 to 27 August 1993. Coordinators and curriculum experts from DPEP states participated in the workshop. Textbooks were reviewed and primary teacher education curriculum was scanned through.

After feedback from the field work in four villages of Kaithal, Haryana and four villages from Tikamgarh, Madhya Pradesh during the third and fourth week of September, the Project Director in consultation with other members of NCGG revised all schedules from 1 to 4 October 1993.

Initial training of professional assistants lasted three days of intense interaction among NCGG members, state coordinators and professional assistants on conceptual issues and field work methodology. *The duration was highly insufficient*

Major components of this training consisted of:

- (i) Gender sensitisation and discussion on status of women on the basis of state status paper.
- (ii) DPEP framework and gender studies.
- (iii) Exposure to interview schedules and forming of a battery of supplementary questions.
- (iv) Mock interviews — individuals and group.
- (v) Formation of teams following the mode of dyad technique: all individual and group interviews were to be conducted by a team of two, sometimes with one person keeping the discussion going and the second taking notes (on schedules/diaries). The role of the discussant and the reporter was to be interchangeable.
- (vi) Methodology of field observation: Maintenance of daily diary.
- (vii) Planning of field work, logistics and time schedule.
- (viii) Actual exposure to field situation in a nearby locality.

It was found impractical to train professional assistants and other state personnel in the highly specialised clinical psychology/psychiatric technique of focussed group discussions. Also the feedback from Kaithal and Tikamgarh field work indicated that assembling of homogeneous discussion groups in the villages or in the slums is not feasible. The moment you enter a community, people just flock in and it becomes difficult to separate them into homogeneous groupings. You have to respond to their curiosity and enthusiasm by making them a part of the discussions. It was, therefore, decided that the NCGG members, and state/district coordinators would themselves undertake group discussions initially so that the professional assistant acquires the working level competency.

This multi-tier field-based training resulted in formation of highly motivated competent field teams. This is a point for enormous satisfaction considering that DPEP is a process directed at generating and developing national/state/district

level capacities for gender studies and gender training. These groups have developed a potential for carrying out further work in the area. The state coordinators are fully equipped to plan and conduct gender intervention in DPEP management, content and process of primary education and gender sensitisation of all educational personnel, parents and community.

### **Limitations**

- Field work slated to start in August had to be delayed till October as funds were released to the states only by September end, after which they appointed the professional assistants. Their training had to be rushed. Field work was completed during October-December 1993 in six states. Field work in Madhya Pradesh continued till March 1994. Orissa responded only in April and has finished field work.
- Field-based research was a new concept and the first experience for several NCGG members and the state coordinators. Despite several national and state level meetings and similar interaction by the NCGG, each state coordinator made some local variations and adjustments.
- As the reports had to be rushed to Delhi by the end of January for a national meeting, there was little time to supervise report writing, data analysis and data display. Despite such pressures, the state coordinators did an excellent job in preparing draft reports based on preliminary analysis of data. As they were handling such data for the first time, analysis was kept simple. The data display and analysis can be further improved as also the report format and content before printing.

### **The Interaction Field**

- (i) *State level:* Education Secretaries, DPIs/SCERTs Directors, State Coordinator Gender Studies State Project team (multi-disciplinary and often drawn from same district/language group).
- (ii) *District level:* District Collectors, District Primary Education Authorities, District Primary Committee comprising officials of other concerned departments, eminent educationists and representatives of NGD.
- (iii) *Block level:* Block Development Officers.
- (iv) *Village level:* Panchayats, community leaders, teachers, parents, drop-out links, never-enrolled links and group discussions.
- (v) In 21 districts under reference in six states, in all, 202 villages/slums were visited.

### Summative Methodological Issues

No attempt is made to aggregate data at the national level as that would be self-defeating. District studies were carried out as district-specific situational analysis of girls' education and women's empowerment (or lack of it!). Each district is a unique social system and within that specific communities have their own sub-systems. Some kind of aggregation can be done at best at the state level, where the responsibility lies for common denominators like:

- (i) Policy measures and programmes for primary/girls' education and women's development and other broad strategies.
- (ii) Curriculum development; textbook preparation.
- (iii) Preparation of teachers for curriculum transaction (pre-service, in-service), .
- (iv) Inter-departmental coordination.

Therefore, gender studies reports are presented district-wise and state-wise only. The studies are fairly detailed, have identified district-specific issues and strategies as perceived to by the users (parents, community, girls) and the members of the delivery system (educational and other development administrators and teachers).

Even though the issues of access, enrolment and retention might look common, the degree or magnitude or requirements, has not only to be district-specific but block-specific and village-specific. As a first step, we have moved to the district as a sub-unit for plan project formulation. In the wake of Panchayat Raj, we have to move towards block level, Gram Panchayat, and institutional level planning. How many, how much is required of the same or the different is to be known.

The study was carried out in the spirit of NPE/DPEP to effect decentralised, participatory planning and implementation of primary education and building state and local level capacities. Although the study design was formulated and finalised with the participation of state coordinators at the national level and constant link was maintained with them and their project teams (professional assistants), effectively, they are the ones who carried out the field work, analysis and report writing within six months. The NCGG provided support at every stage — project staff selection, establishing rapport with state and district officials, orientation of project staff on field work techniques, data analysis and report writing.

The district reports have to be seen in the light of the fact that it was at times the first brush of concerned state coordinator or with social research and that too field-based and empirical. All six state coordinators, extremely capable and dynamic, were *urban middle class women*, who (as they admitted) sat and talked with the parents in villages and slums, listened to their side of the story with empathy, internalised and understood the problems and issued concerning girls'

education and women's equality and made suitable interventions in district level workshops. They can utilise district findings for formulating state level interventions. They have even gone ahead to *phasing* and *costing* of these interventions.

### Data Analysis

The presentation of data and its analysis was kept simple so that the state teams could handle the same with ease. This study is not *quantitative* in any real sense. *Interviews* and *discussions* have been the chief mode in addition to *observation* of the field by the investigators. Analysis of secondary data at the state and the district levels provided the backdrop on girls' education and the status of women (state status paper and district profiles were prepared).

Only simple descriptive statistics like frequencies, percentage, ranking have been employed for a limited *quantification* of *qualitative data* in the form of simple tables. The full scope of even *bivariate* analysis has not been exhausted due to extreme shortage of time. The field diaries and field notes can be further analysed.

Data for all none locations (eight villages and one urban slum) has been clubbed and presented together. The data is available for each location separately. In the second stage, data analysis would be disaggregated column-wise for (i) unserved villages, (ii) villages with primary schools, (iii) villages with middle schools, (iv) villages with high/higher secondary schools, and (v) urban slums. The data can be aggregated row-wise for all DPEP districts in a state to indicate a broader set of findings.

For academic purposes, data on certain variables may be aggregated for all 44 districts — 21 in six states, 19 in Madhya Pradesh and four in Orissa — exercising a lot of care as to what all we are adding, of the same and the different.

The district reports may look quite the same, as they have a more or less common format, but each one read carefully gives more a glimpse of the situation of girls' education and women's status. The reports are drafted keeping in view their users, i.e. district and state level educational administrators and teacher educators. The reports give a brief but clear analysis of the following:

1. Situation of primary education of girls and female literacy (block-wise in some states) and highlight issues of access, low enrolment and low retention and reasons for continuance, discontinuance, non-enrolment as perceived by parents, girls, community, teachers, administrators.
2. Both primary and secondary data on other social and demographic variables provide insights on the actual situation of women and girls in the district and specific rural and urban communities that were studied. One gets an idea as to how gender roles are perceived by chief actors around the girl child—the parents, the teachers, the administrators, the

community leaders—and how the girl herself perceives her total situation if she has dropped out or has never gone to school. What all she does for the family, her hopes, her fears, how equal she feels or is treated by her family, her parents. What does a drop-out remember of her school and her wish/possibility of getting back to education, formal or non-formal? Did the school turn her away or the family factors pulled her out?

Gender studies are based on the assumption that *gender discrimination exists* within the educational *supply* factors, availability of school places/access and within the family situation which determines the *demand* for girls' education and full *utilisation* of available educational opportunities. What look like *causes* for low enrolment, higher drop-out, lower achievement (baseline study) are in fact the consequences of gender discrimination faced by girls on account of traditional gender role perceptions to which most adults (parents, teachers, curriculum developers, book writers, administrators, community leaders) hang on. If education is to equip girls to become empowered women—self confident, self-reliant, capable of participating in decision-making processes, good communicators and informed leaders—provision would have to be made (a) to provide educational facilities, and (b) to make the content and process of education not only gender-bias-free but a consciously designed vehicle of gender equality.

It is *relatively* easier to provide the school places. It is difficult to change the *mind set* of the teacher, the textbook writers and administrators about the traditional perceptions about gender-based division of labour, equal abilities and equal opportunities. Being educated they at least subscribe to the utility of educating girls and gender equality in several areas. The toughest task is to change the extra-school factors where interplay of poverty and gender discrimination becomes a lethal combination and leads to withdrawal from or non-enrolment of girls in schools consigning them to domestic roles and closing any possibility of their participating in extra-domestic spheres except as unpaid family workers or poorly paid wage workers as they grow up.

The studies mark a beginning of the process of gender sensitisation and awareness generation from state to district, to block to village slum communities. In six states and 21 districts nearly 40,000 persons interacted on issues of girls' education and women's equality.

### Major Findings and Recommendations

#### *Access*

- (i) The problem of access obtains in small sized villages and scattered habitations. Availability of educational and other development infrastruc-

ture of health, ICDS, water, electricity, roads, women's development groups/programmes is almost nil in villages with population less than 100 and increases with the population size of the villages. Villages with thousand or more population are better endowed and have higher levels of literacy and schooling facilities at least up to middle and even high school level.

- (ii) Very large villages have a problem when even two primary schools do not suffice and some valuable sections are left out (girls among them).
- (iii) Rains are a time when attendance drops, as *kuccha* roads become slushy and almost non-negotiable and at several places little rivulets and nullahs swell up and become dangerous for small children. In one of the Madhya Pradesh districts there were as many as 200 nullahs and villages. Villages with 21 or 25 households, even 40 households had no school within miles. About 16 per cent of villages of Madhya Pradesh have population habitations below 100; 15 per cent in Karnataka, 8 per cent in Assam, 12 per cent in Maharashtra, 22 per cent in Orissa and 7 per cent in Tamil Nadu, 15 per cent for India as a whole and only 0.39 per cent in Kerala. Parents of unserved villages do not want to send their children especially girls for schooling outside the village.
- (iv) Urban slums are worst off and rarely have a school if it comprises recent migrants from villages.
- (v) There is evidence of a growing demand for girls' education. Interviews with parents and group discussions showed that they all wanted with one voice a school where none exists; a middle school in the village with a primary school, a high school in villages with a middle school.
- (vi) The ratio of middle school to primary schools ranges between 1:3 to 1:6 in different states/districts. Girls are not sent outside the village. Primary education would become a dead end for girls unless commensurate facilities are created at the middle level. Middle schools were located at 3 to 8 km distance from smaller villages.
- (vii) Secondary data shows an alarming trend that needs to be reckoned with. Compared to every 100 rural girls in Class II, only 0.22 are found in Class XII in Assam, 0.29 in Haryana, 1.60 in Karnataka and Kerala, 0.04 in Orissa and 2.53 in Tamil Nadu; 1.44 in India as a whole. And, 12 years of general education is a basic requirement for entry into primary teacher training and into other diploma and degree level general and professional courses.

### *Enrolment and Retention*

- (i) Enrolment ratios for girls at the primary level vary from 80 Per cent in some districts to 116 per cent.

- (ii) With the exception of Kerala, drop-out rates for girls are very high and invariably higher than those for boys.
- (iii) The phenomenon of non-enrolment of elementary age-groups is very high in Madhya Pradesh but is also considerable elsewhere except in Kerala.
- (iv) Drop-out takes place largely after a girl is about 10+ or after primary for lack of a middle school.
- (v) The average-underage phenomenon is to the tune of 25 per cent for girls in primary classes.
- (vi) *Major Reasons for Continuance of Girls*
  - Better economic condition of the household.
  - Parental education and motivation.
  - Parental ability to pay extra tuition costs, provide books, stationery, clothes, create space and time for studies at home.
  - Self-motivation of the girl child.
- (vii)- *Main Reason for Discontinuance of Girls*
  - Domestic work.
  - Inability of parents to provide books, stationery, clothes, extra tuition costs.
  - Parental illiteracy, and lack of motivation.
  - Helping parents in remunerative work.
  - Care of siblings.
  - Early marriage (as early as she is 'big enough' as measured by a *thali* in Madhya Pradesh, Haryana, even among certain communities in Kerala, not so much elsewhere).
- (viii) *Main Reasons for Non-enrolment of Girls*
  - Domestic work
  - Inability of parents to pay extra tuition costs, provide books, stationery, clothes, shoes, etc.
  - Parental illiteracy and lack of motivation.
  - Helping parents in occupation.
  - Care of siblings.
  - Early marriage.
- (ix) *Drop-out Girls*
  - Drop-out girls give similar reasons for discontinuing school. Fetching water and collecting fuel take up a greater part of their time and domestic work includes cooking, clearing and washing.
  - Most of them left school on account of domestic compulsions of work and poverty.
  - Most of them belong to impoverished households.
  - Most mothers are illiterate while fathers are relatively less illiterate.



- Drop-out girls belong to large-sized households.
- Drop-out girls are among the first, second or third born at the most.
- Drop-out girls (nearly all) liked their school and teachers and found them helpful.
- Drop-out girls miss school and majority would like to go back to school, if given a chance.
- Language was their favourite subject and subjects that they disliked most were mathematics and science (EVS).
- Few could read or write but could count up to 10 or 20.
- They get little time to play between myriad tasks and express that parents did discriminate against them and treated their brothers better. The boys were given more food and more time to play. The girls were left behind even when parents went for attending weddings or festivals. Only boys were taken to *melas*. If they fell ill, no proper medical care was arranged whereas the boys were taken to a doctor.
- The study exonerates the school from 'pushing out' girls and it becomes evident that it is the extra-school factors, both economic and cultural (gender discrimination), that 'pull out' girls. Because even within the same households, money is found for bearing the extra-tuition costs for boys' schooling at times. Even boys drop out on account of parental poverty. Ten-years-olds and plus start helping in income saving and income-generating tasks of parents.
- Ten years plus and above drop-out girls want to learn incom-generating programmes in addition to literacy and education on health and nutrition. The parents also want this combination.

(x.) *Never-enrolled Girls*

The girls belong to the poorest of the households with both parents illiterate or a father with a modicum of literacy. In several villages in Sehore and Ratlam in Madhya Pradesh, practically all girls, babies to fourteen/sixteen years were married with *sindoor* adorning their central parting of hair and increasing *kohl* and little trinkets. In Haryana, they were eternally working, walking with a pitcher of water on her head, making cow-dung cakes and washing buffaloes—a new-found prosperity item in every rural household after the agricultural boom. The silver lining was that in unseen villages, parents were clamouring for a school and said they will send these girls to school, even though they may be married.

(xi) *Household Conditions*

- Except for Kerala, the average household size ranged between 5 and 6.
- Drinking water has to be fetched by girls from nearby, or a distance of half to one kilometre and more. In several Madhya Pradesh villages,

girls and women had to cover a distance of two to three kilometres at times to get potable water.

- Wood is the main source of fuel, cent per cent reliance on this in several villages. The wood is collected by girls and women, is time consuming and eco-destructive.
- Sanitation and drainage is extremely poor in Madhya Pradesh and Haryana for instance; 95 to 100 per cent households use open spaces for defecation and women have to wait until it is dark causing personal discomfort, often disease. Sexual harassment is another hazard of lack of private or decent public toilets. The situation is better in Kerala, and in Assam most of the households had private latrines, a little unusual but welcome.
- Majority of households were poor/low income households in Madhya Pradesh. There were a very small proportion who had annual income above Rs 12,000.

### *Situation of Girls and Women*

Our basic assumption that gender discrimination accounts for lower participation and larger drop-out of girls in primary schooling is borne out by the study. Access of girls to education and their development is contingent on the status accorded to women in a particular group. Only a few salient features of group discussions and interviews with parents, teachers, girls themselves, community leaders and administrators are discussed.

- (i) All the of 44 districts have low female literacy (including Malappuram, Kasargode and Wayanad compared to other districts in Kerala); male-female differentials are large and rural female literacy rate is half or less than-half of urban female literacy rate. In Malappuram the sex ratio is 1054, and females form 51.32 of the population, but only 49 per cent of primary enrolments; in Kasargode, with sex ratio of 1026, females account for 51 of the total population but only 48 per cent of primary enrolment.
- (ii) District data shows a positive relationship between female literacy and female age at marriage, female school enrolments and a negative relationship between population growth rate, infant and child mortality rate, family size among others.
- (iii) The national trend of declining sex ratio (an average) is seen very vividly at district level. The sex ratio ranges from 865 to 1054. In Kerala, Wayanad has a sex ratio of 967 compared to 1026 in Kasargode and 1054 in Mallapuram. Situation in Assam, Tamil Nadu and Karnataka and Orissa districts is not as grim but in Marathwada

districts, Aurangabad, for instance, has sex ratio of 922. All four DPEP districts of Haryana and several districts of Madhya Pradesh have sex ratio as low as 865 to 882. In Jind, Kaithal, Hisar and Sirsa, there are village after village where only 500 girls were found per 1,000 boys in the age-group 0-6 years. Group discussions and interviews with health authorities show that female foeticide has acquired menacing proportions with proliferation of private ultra-sound clinics, amnionitis. These trends if allowed to continue can cause social aberrations and adverse repercussions, the effects of which would become evident much later as is being experienced in the post-one-child family in China. Common people's perception in that ultra-sound machines have been installed by the Government to help reduce the family size. Government hospitals/PHCs are aborting female fetuses as late as 6-7 months of pregnancy. Dowry was cited as the main culprit for this criminal behaviour pattern.

The district and village level data, for example in Madhya Pradesh, showed that sex ratio was positive to women among the scheduled tribes and even among scheduled castes. Rajnandgaon (Madhya Pradesh) a district with substantial tribal population has sex ratio of over 10:30. This, however, only indicates that girls are valued in tribal communities because women are the key actors in keeping subsistence households together and girls help mothers and also fetch a bride price.

- (iv) The status of women varies in different socio-cultural groups, castes, communities within and among districts. Karnataka DPEP districts report evils of prostitution, Devadasi system. Dowry is eating into the vistas of Kerala and Tamil Nadu, where literacy/education indicators are high. In Rajgarh in Madhya Pradesh, for instance, villages after villages live off on the earnings of girls as prostitutes. In Sehore and Chattarpur and practically in all Madhya Pradesh districts nearly all girls were found married (not reported). Child brides and girls with younger siblings in arms was a common sight, so was *purdah*.
- (v) Interviews with parents, teachers, educational administrators and community leaders and group discussions indicated that usefulness of educating girls is increasingly being felt. Their reactions were obtained on nine positive statements. Parental perceptions (mostly uneducated), were different somewhat from those teachers and administrators. Education of girls is seen as a means of increasing their economic contribution, for development of a positive self-image, ensuring education of future generations and for reducing family size. Parents are unable to appreciate the relationship between education of girls and family's health and nutrition and infant and child mortality, etc. There

is lower importance attached to education, preparing girls for leadership and participation in decision-making process and making them aware of their rights. Teachers and administrators and even community leaders have more favourable views.

- (vi) Interviews with parents, girls, teachers, educational administrators and community leaders brought out their perceptions of gender equality/discrimination to the fore. Most agreed that girls need equal food (not all), health care and education but not equal freedom and not even equal time to play. All are not sure, whether girls are endowed with equal intelligence and similar abilities and can perform all tasks equally well and boys can have some occupations. There is complete agreement on equal wages but not equal sharing of work within the family. In as much as they oppose equal freedom, there is resistance to joint ownership of assets by wife and husband (Maharashtra has already passed this bill) anywhere and everywhere there was total opposition to female inheritance of property. Even middle class educated persons would give all they have by way of assets to sons; girls are given dowry.

In all, it was evident that educational administrators were most egalitarian followed by community leaders and teachers and parents. Positive responses aggregate for these groups separately, for instance, in Haryana DPEP districts show egalitarian score (0-13) of 8 parents, 10.6 for teachers, 11 for educational administrators and 10.05 for community leaders. The positive gender equality responses may also be taken with a likely pinch of salt, as people may 'agree' for forms sake but are not likely to practise equality. But the fact that there are variations among chief respondents, among districts, gives us along with utility of girls' education items an idea as to where to pitch gender sensitisation programmes.

- (vii) We have already mentioned that drop-out and never-enrolled girls do perceive that they are discriminated against in matters of food, clothes, health care and above all play and entertainment, despite disclaimers from parents who, as the study brings out, have lower educational and occupational aspirations for daughters as compared to sons. Responses on parental expenditure (extra tuition costs) on education of children by sex are not very reliable but do indicate relatively higher expenditure on sons as compared to daughters, as data in some districts show. Contrary to some western studies, girls (drop-outs) in our sample did not report any negative attitudes of teachers, and spoke very fondly about their teachers and their helpful attitude. Gender-based divisions of labour and resources is all too evident from the studies and indicate very clearly the disabilities and discrimination faced by girls and

women and the need to work with parents, community, teachers and administrators to bring about a positive shift towards gender egalitarian social roles for boys and girls, for men and women.

- (viii) As is obvious from demographic and educational data, you give females equality and they become more than equal. If, they are allowed to be born and survive age till 5 or 35, they live longer. If they remain within the educational system, their achievement level equals boys (Baseline Study, Dave's Study) and surpasses literacy, education and even employment do not automatically bestow equality on women. Kerala district reports show that women are conscious of their inferior status despite high literacy, carry the double work-day burden, and are bossed over by men in all situations and have very little say in decision-making. And all is seen to be well with Kerala women, for they have lesser number of children, of whom very few die. Generally, high literacy levels of males and females may have caused the demographic transition to lowest population growth rates in the country in this state, but for most of Kerala girls education ends at the high school, less than 2 per cent (1.58) girls making it to Class XII. And the high-literacy Maharashtra and Tamil Nadu are getting infamous for female foeticide, so are Haryana and Punjab, the two most affluent states in the country.

The complexity of issues of status of women's equality and the role of education have to be better understood. Not any education, but education which is gender-sensitive and gender-inclusive, with consciously designed curriculum and teacher education combined with social mobilisation can translate the NPE mandate of Education for Women's Equality. The girl child needs Survival, Protection and Development.

District gender studies can help work out districts/state agendas for education and empowerment of girls.

*Collection of information on gender bias in (a) textbooks, (b) teacher training, (c) teachers attitude, (d) curriculum transaction, and (e) administrators' attitude*

- (i) Review of Hindi and mathematics textbooks has been completed for Haryana, Karnataka, Tamil Nadu and Assam have done this exercise. Maharashtra has already revised its textbooks.
- (ii) Gender role perceptions of teachers and administrators have been obtained and analysed.

*Identification of supportive community structures such as women groups, VECs, Panchayats, PTAs, Teacher Organisations, Youth Clubs, supporters of UPE amongst girls*

Women's groups under Mahila Samakhya are active in some districts of Karnataka. Mahila Mandals in Haryana exist but are totally ineffective. In Madhya Pradesh, these are almost non-existent. Due to paucity of time, only Sarpanchas and Panchayat members were contacted. It is heartening to report that majority of them were aware of most of the programmes for education of girls and women's development. They reported very feeble participation of women in Mahila Mandals and Panchayats. They welcomed opening of NFE Centres for girls and were willing to provide space and other support needed.

*Identification and facilitation of convergence of services of different departments for UPE among girls (focal areas : ECCE, Health and Support Services)*

At the moment there was near absence of any connection between the Department of Health, Department of Women and Child Development and the school system. There was no coordination between the Anganwadis and the school. The coverage is extremely low, for instance, in Madhya Pradesh, only big villages had one Anganwadi, in Haryana, large villages had up to 8-9. Anganwadis and small sized villages had none. Blockwise position shows coverage of 0-6 age-group from 20.48 per cent in Rania block in 39.15 per cent in Baragudha block in district Sirsa, for example.

It is proposed that the timings and proximity of Anganwadis to schools must be coordinated. It is also suggested that non-formal education centres for girls be opened next to the Anganwadis with simultaneous timings.

*Availability of educational (books, stationery, uniforms) and other incentives (noon meals, attendance prizes, etc.)*

Incentives like free textbooks, stationery, uniforms, attendance prizes are being given to scheduled caste and scheduled tribe girls. This has had a visible impact on enrolment of scheduled caste girls at the primary stage in Haryana, Tamil Nadu and Maharashtra.

In Madhya Pradesh, incentives are being provided to SC and ST children. Impact studies are needed especially where parents are unable to provide for extra tuition costs for girls. Maximum number of parents and respondents seek provision of free books, stationery, clothes, even noon meals to all girls for boosting their educational participation.

*Participation of Women in Teaching and Administration*

- (i) Proportion of women in primary teachers varies from 15 to 55 per cent in different districts. Participation of women in educational adminis-

tration at the district and block level is nearly negligible in Madhya Pradesh and very low in other states.

- (ii) It was found that there were very few women teachers in remote areas. All discussions pointed to the need for atleast one woman teacher in every primary school. Parents were reluctant to send their daughters to single (male) teacher school as they felt that their daughters were not safe especially if the teacher was absent.

#### *Development of State/District Level Monitoring and Evaluation Framework*

(To be done under MIS) As soon as all data is analysed, indicators for monitoring girls education and women's empowerment shall be developed.

#### **Programme Interventions**

1. School Mapping keeping in view special requirements of girls.
2. Multiple Delivery System
  - (i) Opening of junior primary-part schools, NFE centres, voluntary schools for schoolless habitations and villages.
  - (ii) Access of girls to post-primary and secondary education completing primary or middle schools through upgradation of primary schools (relaxation of 3 km norm)
  - (iii) Distance mode/open school
  - (iv) Residential schools for girls in each block headquarter.
3. Bicycles to be provided to girls completing primary schooling for attending middle/high school. This scheme may cause a mini-revolution in making girls physically and mentally mobile and confident. This scheme is being implemented in Tribal Welfare Development blocks in Madhya Pradesh. In a Ratlam tribal village, there was a lone girl who had completed primary education. Her eyes lit up when asked, would she like to go to a middle school, if she had a bike. With or without bicycle, she wanted to study more.
4. Social mobilisation for girls' education.
  - Girl child campaigns
  - Increasing parental awareness and participation in educational management.
  - Mobilising women, Panchayats, youth, teacher organisation and NGO.
  - Media campaigns
5. TLS/adult education efforts to be intensified to remove parental illiteracy, a major hurdle to enrolment and retention of girls.

6. Interdepartmental coordination committee to be headed by the District Collector with DEO as member-secretary to ensure :
  - (i) Provision of drinking water within residence/habitation to save female energy and girls' time.
  - (ii) Provision of non-conventional eco-friendly fuel, e.g. biogas to save forests and women and girls from walking with head-loads of firewood. Not only animal dung (which keeps girls and women busy, collecting and making cow-dung cakes for fuel) but even human excreta can be utilised for generating gas. A combination of Sulabh Shauchalaya and biogas plants could serve community needs and save the school time of girls.
7. Out-of-school adolescent girls need to be reached out through NFE, condensed courses of Central Social Welfare Board, Open School and Balika Yojna (scheme for adolescent girls combining literacy, health and nutrition education and income-generating skill, Department of Women and Child Development, MHRD), to ensure that they complete primary and upper primary education.
8. Intensification of poverty removal and rural development programmes in low female literacy DPEP districts as a complementary strategy (coordination at the state level by Chief Secretaries and District Collectors at the district level). Poor economic condition of parents is a major hinderance to educational participation of girls. Special programmes to be directed at women through DWCRA and setting up of women's cooperatives and women's banks. The reasons for low educational participation of girls are systemic and hence cannot be handled by education alone
9. Studies may be mounted to assess the level of readiness of communities and states to enforce compulsory education laws. Tamil Nadu had taken an initiative and all children are getting a free noon meal and even free books and uniforms.
10. In Madhya Pradesh and elsewhere it was noticed that girls are withdrawn at the onset of puberty. Education on management of menarche and reproductive functions for girls (the latter for boys to) should be preceded by provision of separate toilets for girls in primary and middle schools.
11. Convergence of Services : UEE, ECCE/ICDS linkages to be forged and operationalised by increasing ECCE coverage and coordinating timings and proximity to the extent possible.
12. Special schemes to be formulated to prepare women teachers for rural areas from rural areas. Madhya Pradesh is considering launching of Shiksha Karmi Programmes with focus on training and upgrading



primary, middle pass local persons/girls for teaching in remote areas Urban women who commute daily to rural areas neither feel themselves as a part of local people nor have the time to interact with them.

13. Incentives like free books, free stationery, uniforms, shoes, waiving off of all extra tuition levies, are demanded by the parents and village communities. A major review of the existing schemes should be carried out before offering such package on a large scale.

### *Research and Development*

#### A. RESEARCH

- (i) Study of the impact of existing incentive schemes on enrolment and retention of girls.
- (ii) Study of socialisation patterns and practices derogatory to status of women and to appropriate development of the girl child.
- (iii) Study of innovation programmes of girls' education.
- (iv) Study of role of teacher in development of a positive = self image in the girl child
- (v) Study of gender role perceptions of teachers, teacher educators, educational administrators and 'community leaders.

#### B. DEVELOPMENT

- (i) Removal of gender bias from textbooks and other learning materials for primary (formal, non-formal) and TLC by (a) providing guidelines for gender equality to DPEP administrators, curriculum developers, textbook writers, teacher educators, NFE workers, literacy workers and ECCE workers; (b) developing gender sensitisation materials for orientation of education personnel and the community — parents, women's groups, Mahila Mandals, VECs, Panchayats; and (c) developing of girl child campaign materials.
- (ii) Preparation of gender inclusive exemplar materials for primary (formal, non-formal) and TLC.
- (iii) Preparation of handbooks for teachers
- (iv) Development of tools for monitoring of girls' education and women's empowerment in DPEP.
- (v) Preparation of inputs for pre-service and in-service training of teachers (Based on analysis of existing teacher education programmes).

#### C. TRAINING AND EXTENSION

Training workshops of trainers at state level, multilevel, integrated (state, district, block, village and community).

# Readability Assessment of Primary Level Textbooks

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## ABSTRACT

*Class III textbooks in language, environmental studies and mathematics in the major language of each of the six DPEP States namely Assam, Haryana, Kerala, Karnataka, Maharashtra and Tamil Nadu were evaluated in terms of their Readability level with the objective of providing information for inservice teacher training in use of existing textbooks and guidelines for preparation of new textbooks. Readability was considered in terms of Vocabulary, Conceptual difficulty and Syntax. The study investigated (a) extent of readability of each textbook, (b) areawise differences, and (c) parity in readability across three subject areas. A triangulated research design was adopted to include (i) linguistic-analysis of each textbook, (ii) direct assessment of children's comprehension level for each textbook at the end of the session, and (iii) teacher interview. Results of the study indicate state and area-wise differences in readability of textbooks. Variations in parity in readability level across subjects were also observed. Implications of results in terms of textbook preparation, teacher training and methodological issues are discussed.*

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## The Context

Any organised teaching-learning situation can be basically construed as consisting of a specific curriculum which, in turn, would include the syllabus, the instructional materials and the transactional strategies. The ultimate efficacy of the learning situation would thus be dependent to a large extent on the relevance of each of these components in the context of the learner and the learning outcomes.

In the national context today the significance of an appropriate curriculum becomes even more critical in view of the efforts towards universal primary education wherein the diversity of students' needs will inevitably become still greater and so will the need to adapt educational approaches to match curriculum, instruction and learner.

In the Indian situation, at the primary stage, the textbook continues to be the most essential and in majority of cases the only aid in the hands of the teacher and the learner through which the given curriculum is transacted. This situation consequently places a heavy responsibility on the quality of the textbook for ensuring effective teaching-learning interactions and outcomes. For any instructional material to be effective, it has to be necessarily planned keeping in view the requirements of the learners particularly with reference to their age, their educational and cultural background, their immediate environment as well as their proficiency in the language which is the medium of instruction.

A large number of textbooks are being prepared in India every year, both at the central level and in the different states. Recent researches, however, have led to the speculation that the effectiveness of these textbooks is often restricted because of a lack of parity between the skill levels required by the textbooks and those available with the students. Often the distance between the home language and the standard language used in the textbooks also serves as a contributing factor. There is a dearth of research input or base to facilitate informed decisions regarding appropriateness and sequencing of content to match the linguistic competence of the target group. As a result neither any state nor any central agency has specified any language content to be used in the textbook in linguistic terms. Norms of linguistic competence of our children are also not defined. The authors do not get any specific guidelines or training and are often not even familiar with the needs of the stage of education for which they are writing.

From the point of view of the quality of a textbook its level of readability becomes a critical factor which could help or hamper the understanding or learning by the learner depending on the extent of match/mismatch between the linguistic competence demanded by the text and that available with the learner. This factor is critical not only in the language readers but also in the textbooks for other subject areas like environmental studies and mathematics particularly in Classes III, IV and V wherein higher level of conceptual understanding is required. To facilitate this understanding the readability of the text used must be ensured in these textbooks. However, often the level of EVS and mathematics textbooks are observed to be pitched even higher than the language readers that are in use for the same class. There is an imperative need, therefore, for an indepth empirical study of the existing textbooks in the above context in the three main curricular areas.

Recognizing this need, NCERT was commissioned by the World Bank in

February 1995 to conduct a quick study of a short duration on these very lines in collaboration with Central Institute of Indian Languages (CIIL), Mysore.

### Objectives and Scope of the Study

The objectives for the study were “to evaluate the readability level of primary level textbooks, provide information for inservice teacher training in the use of existing textbooks; and guide the preparation of new textbooks so that they are more readable ”

Readability has been defined as, “the sum total (including the interactions) of all those elements within a given piece of printed material that affects the success, a group of readers have with it. The success is the extent to which they understand it, read it at an optimum speed and find it interesting” (Dale and Chall, 1949).

It could thus encompass several quantifiable and non-quantifiable dimensions including legibility of print, illustrations and colour, vocabulary, conceptual difficulty, syntax, text organisation, text redundancy, etc. For the purpose of this study, however, considering its limited scope and focus, readability has been considered in terms of Vocabulary, Conceptual difficulty and Syntax.

This study was limited to Class III textbooks in language, EVS (I and II) and Mathematics in the six DPEP states, viz., Kerala, Karnataka, Tamil Nadu, Haryana, Maharashtra and Assam.

### Research Questions

The study has primarily addressed the following research questions that have emanated from the objectives :

1. To what extent are the textbooks “readable” (in terms of the specific components, i.e. vocabulary, conceptual difficulty and syntax) and cater to the diverse linguistic needs and levels of children in different geographical contexts of a state?
2. Is there parity in terms of readability of the textbooks across the three subject areas?

### Review of Related Studies

Studies conducted in the area of readability have been guided by three main purposes — (i) to identify factors which validly distinguish easier from difficult material, (ii) to find a reliable means of measuring these factors, and (iii) to formulate some kind of an index through combination of these factors for predicting readability. These have led to the following three main categories of research in the area of readability.

*I. Quantitative Associational Studies :* Quantitative associational studies have been the most characteristic of readability measurement. The typical product of these studies has been the various readability formulae based on the counting and weighing of several significant factors in the printed material, and to predict the reading skills necessary to understand it. The first phase of these studies emphasized primarily the vocabulary factor (Patty and Painter, 1931; Stone, 1938). Later the focus shifted to other factors which could be significant predictors of difficulty in addition to vocabulary. Initially a large number of factors were identified, but were reduced to only a few in view of the high intercorrelations among them. Large (1949), Yoakam (1948), Flesch (1948), Dale and Chall (1949), Fry (1990), etc., used specialised criteria in their studies on readability. The two factors common to all formulae had been vocabulary difficulty and sentence length.

Studies conducted in the last two decades have continued to delve further into factors affecting readability including discourse structure (Cooper, 1970; Moir, 1970; Allende, 1987, 1990; Gourley, 1984). Gross and Sadowski (1985) gave a microcomputer programme called FogIndex but also concluded that no readability estimate can replace commonsense and individual judgement.

*II. Surveys of Experts and Reader's Opinion :* Surveys of experts' and readers' opinion in the area of readability have been very few but significant. These surveys have, while confirming the importance of stylistic factors also called attention to the importance of other factors not measured by formulae, i.e., content, format and organisation features and factors of readers' interest and motivation (Gray & Leary, 1940; Strang, 1948; Kukemelk & Mikki, 1993).

*III. Experimental Studies :* Experimental studies have generally attempted to assess the impact of planned intervention on readability. These have investigated effects of factors like redundancy, style of narration, inclusion of direct conversation, etc., on readability (Englemann, 1936; Burk, 1936; Wilsons, 1948; Horning, 1987; Currie, 1990 and Siegal *et al.*, 1974).

Very few studies have been conducted in the area of readability of textbooks in India as yet. A major study of direct relevance is that of Sharma (1993) which investigated the comprehensibility of language of Class III textbooks of language, science and social studies of Rajasthan. The study included a linguistic analysis of the textbooks as well as a collection of spoken and written language of children of Class III and made a comparative analysis. The study did highlight some inconsistencies between the language used in the textbooks and the spontaneous language of children, particularly in terms of vocabulary and sentence length. It also brought forth differences between urban-rural groups and reiterated the need to cater to both.

Agnihotri and Khanna (1991) and Kapoor *et al.* (1993) applied the well-known Fog formula (Gunnings, 1952) and Smog formula on Hindi textbooks using

different samples. But the result invariably places the readability level of the examined textbooks to be much above the intended level. They have also reported a high correlation between performance of children on the cloze and comprehension tests.

The dearth of studies specifically in the area of readability of textbooks in India, however, only reinforces the need and priority for such studies, since these could contribute significantly to the improvement of quality of instructional material being produced for the primary grades.

## Methodology

### *Design*

A triangulated research design was adopted to include

- content (linguistic) analysis of each textbook,
- assessment of readability through direct testing of comprehension level of children for each textbook with respect to the linguistic content.
- interviews of teachers to invite their opinions on readability of the textbooks and the ways in which they use the textbook in their classroom transactions.

### *Procedure*

*Identification and Content (Linguistic) Analysis of Textbooks* : For the purpose of content analysis of textbooks for Class III prescribed in six DPEP states in the areas of Language, Mathematics and Environmental Studies (I and II) were identified. The languages covered were Assamese (Assam), Hindi (Haryana), Marathi (Maharashtra), Kannada (Karnataka), Malayalam (Kerala) and Tamil (Tamil Nadu).

Content analysis of each textbook was done on sample basis for Vocabulary (nouns, adjectives, adverbs and verbs), sentence type and average length of sentence. For the purpose of applying the Readability Formulae, specifically the Fog Index and Fry's Extended Readability Graph, three separate samples were selected from each of the language and EVS I and II textbooks and appropriately analyzed.

*Test Construction — Comprehension Tests* : For direct assessment of readability based on performance of Class III learners, curriculum based assessment tests were constructed. "Curriculum based Assessment is asking students to perform tasks that have been drawn directly from the curriculum and then using assessment results to adapt instruction to reflect the learners' needs" (Hargis, 1987, Shinn 1989). The tests included :

- (a) Cloze tests
- (b) Passage Comprehension tests and

# READABILITY ASSESSMENT OF PRIMARY LEVEL TEXTBOOKS

## (c) Vocabulary tests

For Mathematics only vocabulary test was used.

*Reading and Writing Test* : For this test, ten most frequently occurring words were identified on the basis of the linguistic analysis of each textbook. These ten words were listed out. These were dictated to a sample of ten children selected randomly who were subsequently asked to read the words written by themselves.

## Sample

*Comprehension Test* : The sample drawn was purposive to certain extent since only those schools were selected which were known to be relatively more regular in their functioning. This was done to ensure that poor schooling may not confound the readability factor as reflected in the children's achievement for this study. All students in Class III of selected schools were covered to optimize the possibility of getting a normal distribution. Both boys and girls students of each area, i.e., Urban, Rural and Tribal were included in the sample. Table 1 gives a complete picture of the sample from the concerned states.

TABLE 1  
Total Sample Profile

States	Group	Area			Grand Total	Total No. of Schools		
		Rural	Urban	Tribal		R	U	T
Assam	Boys	22 (30.55)	40(55.56)	10(13.89)	72 (100)	2	2	2
	Girls	19(25.18)	42(56.75)	13(17.57)	74(100)			
Haryana	Boys	30(46.08)	34(53.18)	—	64(100)	2	2	—
	Girls	35(43.75)	45(56.25)	—	80(100)			
Maharashtra	Boys	25(17.60)	75(52.82)	42(29.58)	142(100)	2	2	4
	Girls	75(54.35)	25(18.12)	38(27.53)	138(100)			
Karnataka	Boys	39(39.40)	44(44.44)	16(16.16)	99(100)	6	4	2
	Girls	31(38.37)	36(44.44)	14(17.28)	81(100)			
Kerala	Boys	27(39.71)	30(44.12)	11(16.17)	68(100)	1	1	1
	Girls	23(37.1)	20(32.26)	19(30.64)	62(100)			
Tamil Nadu	Boys	25(37.31)	23(34.33)	19(28.36)	67(100)	1	1	1
	Girls	25(39.68)	27(42.86)	11(17.46)	63(100)			
Total Sample	Boys	168(16.63)	246(24.36)	98(9.70)	512(50.69)	14	12	10
	Girls	205(20.59)	198(19.31)	95(9.41)	498(49.31)			

Note Figures in parentheses indicate percentage

*Reading and Writing Test :* A sample of 10 children of Class III were selected on random basis from each school. In all 70 children constituted this sample, of these 40 children were urban (10 each from four states Assam, Haryana, Maharashtra and Karnataka), 20 Rural (10 each from two states Assam and Haryana) and 10 were tribal (Assam).

*Interview Schedule for Teachers :* A semi-structured Interview Schedule was constructed for teachers to elicit their opinions regarding the readability level of the textbooks with reference to the target group, and the ways in which the textbooks were used by them in day-to-day teaching. In all 84 teachers were interviewed across the six states.

### Analysis

The data received from the six states were scored and tabulated in terms of :

- (i) *Content Analysis :* (a) consolidated frequencies of nouns, verbs, adjectives, adverbs, (b) total number of simple, complex and compound sentences, (c) average number of words per sentence.
- (ii) *Readability Assessment :* The data have been analyzed into: (a) cumulative frequencies which have been drawn up for comparison of distributions across subjects/groups, (b) significance of difference between means of different sub-groups, (c) correlations between scores obtained in different subjects/item-types.
- (iii) *Teachers' Views on Readability and Use of Instructional Material :* Frequency analysis was undertaken to get a profile of teachers' views on readability.
- (iv) In addition to this the Fog Index and Fry's Extended Readability graph were applied to sample text drawn from each textbook to arrive at a ready indicator of the readability level of each textbook.

### Results and Discussion

Prior to discussion of the results obtained from the study it is imperative to emphasize that this study is essentially exploratory in nature and its results can at best be indicative only of possible trends, not definitive judgements or conclusions. The reason for this is that due to acute time and budgetary constraints, the study had to be necessarily limited in scope in terms of

- (a) Its treatment/definition of the concept of readability so as to include only the minimum possible aspects.
- (b) Selection of sample which was essentially purposive in nature and in no way representative of the larger population



- (c) Non-availability of normative data on children's vocabulary and linguistic competence to serve as a bench-mark.

Yet, the triangulated nature of the design of the study serves to validate the findings to some extent through supplementing/complementing the information from one source of data to another which thus emerges as a strength of the study.

The results of the study are discussed in terms of the two research questions specified earlier.

#### HOW READABLE ARE THE TEXTBOOKS ?

Readability of the textbook for the six states in each subject is discussed taking the consolidated view as provided from the three sources of data for the total sample as well as sub-groups.

- (a) \* Direct assessment of children on comprehension tests
- (b) Content analysis of textbooks
- (c) Teachers opinions/perceptions regarding the textbooks.

#### *Language Textbooks*

With respect to children's performance (Table 2) it is evident that from the frequency distribution pattern language textbooks tend to be toward easier side for Maharashtra, Assam, Kerala and Tamil Nadu (31 per cent to 70 per cent scoring over 75 per cent) and relatively difficult for Haryana and Karnataka (more than 50 per cent children scoring less than 50 per cent). Area-wise differences (Table 3) have also emerged on children's performance on readability tests. While urban children scored significantly higher in Assam, Tamil Nadu and Haryana in Tamil Nadu rural-tribal differences were also significant in favour of the rural sample. In Maharashtra and Karnataka the rural sample significantly outperformed the urban and tribal samples with urban being the lowest in Maharashtra and tribal in Karnataka ( $p < .01$ ). Interestingly, in Kerala the tribal children scored highest followed by rural and then urban ( $p < .01$ ). In terms of actual readability of the language textbook in Assam, Karnataka, Haryana and Tamil Nadu the readability is low for the rural sample only while in Karnataka and Tamil Nadu it is low for all the three sub-groups. In Maharashtra, it is possibly on the easier side for

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\* Although there are no categorical norms about rating a book as readable in the Indian situation, rationally it was considered that if 20 per cent of the children score above 75 per cent of the marks and less than 16 per cent of the sample score below 25 per cent of marks, the book could be considered fairly appropriate in terms of readability. This rationale is based on : (a) the assumption of normal distribution, and (b) the principle followed in textbook writing of pitching the level a little higher than the average. Frequency distributions (Table 2) for different subjects across the states were analyzed from this angle.

# READABILITY ASSESSMENT OF PRIMARY LEVEL TEXTBOOKS

TABLE 2

Children's Performance on Readability Tests in Cumulative Frequencies (%)

Subject	Group	States					
		Assam	Haryana	Maharashtra	Karnataka	Kerala	Tamil Nadu
Language	≤ 100	100	100	100	100	100	100
	≤ 75	45	81	30	86	57	69
	≤ 50	18	55	11	54	35	29
	≤ 25	3	24	1	27	20	18
EVS I	≤ 100	100	100	100	100	100	100
	≤ 75	73	85	63	93	67	60
	≤ 50	40	61	39	64	42	31
	≤ 25	6	41	20	32	25	16
EVS II	≤ 100	100	100	100	100	100	100
	≤ 75	58	99	57	93	78	39
	≤ 50	33	90	24	81	51	22
	≤ 25	7	46	1	44	22	4
Maths	≤ 100	100	100	100	100	100	100
	≤ 75	60	99	49	86	69	53
	≤ 50	38	88	19	64	26	26
	≤ 25	16	42	2	24	9	11

EVS = Environmental Studies, Maths = Mathematics

all the three sub-groups and in Kerala the difficulty level appears high only for the urban sample.

Looking at content analysis of language textbooks in terms of Vocabulary (Table 4) and Syntax (Table 5) it was observed that language textbooks of the states show a common pattern with maximum usage of nouns followed by adjectives, verbs and adverbs, the only deviation being in the Maharashtra textbook where percentage of adjectives overtakes percentage of verbs (Table 4). The above pattern was also reported by Sharma (1993) in his study on comprehensibility of primary level textbooks of Rajasthan. Pattern of children's own vocabulary at Class III level (Sharma, 1993) was also in tune and thus a positive indication in favour of the language textbooks.

The trend of sentence usage was found consistent for the language textbooks of Haryana, Maharashtra and Karnataka with maximum usage of simple sentences followed by complex and then compound sentences; in Assam, there is a slight deviation. The percentage of compound sentences (6.48) is marginally higher than that of complex sentences (5.96). Interestingly, there were no compound sentences used in Tamil Nadu and Kerala language readers. But the

TABLE 3

Area-wise Children's Performance on Readability Tests in Cumulative Frequencies (%)

Subjects	Area				Urban				Rural				Tribal					
	State	AS	HR	MH	KA	KE	TN	AS	HR	MH	KA	KE	TN	AS	MH	KA	KE	TN
Language	≤ 100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	-
	≤ 75	20	68	37	83	80	24	83	98	7	84	46	72	70	49	93	17	100
	≤ 50	5	28	8	57	64	6	39	89	-	41	22	16	26	28	83	-	90
	≤ 25	1	9	-	32	38	-	10	77	-	13	12	2	-	4	50	-	73
EVS I	≤ 100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	-	100	-
	≤ 75	61	74	93	83	86	4	95	98	26	97	66	36	87	62	100	37	-
	≤ 50	18	36	55	65	74	-	68	92	2	73	30	8	48	35	67	10	100
	≤ 25	-	13	18	40	52	-	10	77	-	21	6	-	9	13	33	10	37
EVS II	≤ 100	100	100	100	100	100	100	100	-	100	100	100	100	100	100	100	100	-
	≤ 75	35	99	90	85	98	2	90	-	15	99	98	40	87	69	97	43	100
	≤ 50	13	81	43	75	78	-	59	100	1	87	78	4	57	30	73	7	90
	≤ 25	2	26	-	47	48	-	10	70	-	35	48	-	13	4	60	3	27
Maths	≤ 100	100	100	100	100	100	100	100	-	100	100	100	100	100	100	100	100	-
	≤ 75	54	99	74	79	88	2	68	100	12	92	74	76	70	64	93	43	100
	≤ 50	40	81	15	61	46	-	27	97	-	61	14	16	52	16	80	13	87
	≤ 25	22	21	1	29	20	-	13	67	-	21	2	-	4	5	27	3	43

AS = Assam, HR = Haryana, MH = Maharashtra, KA = Karnataka, KE = Kerala, TN = Tamil Nadu

TABLE 4

State and Subject-wise Linguistic Analysis of Class III Textbooks in Percentages

Subject	State	Noun	Adjective	Adverb	Verb
Language	Assam	58.31	5.54	5.79	30.60
	Haryana	50.95	16.03	14.44	18.58
	Maharashtra	45.45	25.58	5.07	23.90
	Karnataka	53.53	7.05	4.36	35.06
	Kerala	50.91	16.86	7.77	24.46
	Tamil Nadu	54.30	4.30	8.87	32.53
EVS I	Assam	66.98	7.15	1.11	24.75
	Haryana	55.65	20.93	10.30	13.12
	Maharashtra	60.74	19.75	1.98	17.53
	Karnataka	82.31	5.38	1.54	10.77
	Kerala	62.86	8.57	4.08	24.49
	Tamil Nadu	50.52	7.55	9.90	32.03
EVS II	Assam	59.58	8.41	1.41	30.60
	Haryana	31.45	13.04	16.52	38.99
	Maharashtra	57.36	27.93	2.01	12.61
	Karnataka	64.33	6.42	4.09	25.15
	Kerala	67.89	10.75	1.33	20.03
	Tamil Nadu	55.37	10.24	5.85	18.54
Maths	Assam	41.76	25.95	10.13	22.16
	Haryana	62.74	21.97	2.23	13.03
	Maharashtra	54.32	15.14	3.78	26.76
	Karnataka	71.58	2.19	1.09	25.14
	Kerala	61.42	15.23	5.08	18.27
	Tamil Nadu	51.16	7.44	9.77	31.63

percentage of simple sentences remain higher in Kerala whereas in Tamil Nadu percentage of complex sentences overtook simple sentences. Apparently, this factor did not affect the readability of the textbooks as judged by the readability scores of children on language test across different states. Sharma (1993) reported a slightly different pattern in Rajasthan language (Hindi) textbook with highest percentage of simple sentences (88.7) followed by compound (7.23) then complex sentence (4.06). Pattern of sentence usage as observed in spontaneous language of children of Class III in Sharma's study is more consistent with that of Maharashtra, Haryana and Karnataka with highest percentage of simple sentences followed by complex (7.23) and then compound sentences.

State-wise variations were observed in sentence length/ type. In the case of simple sentences average sentences length ranges from 4.10 in Tamil Nadu textbook to 7.70 in Haryana textbook. For complex sentences, length ranges

Subjects	State	Sample Page No	Simple Sentence			Complex Sentence			Compound Sentence		
			No.	%	Avg. No. Wds	No	%	Avg Wds	No.	%	Avg No. Wds
Language	Assam	8	95	87.96	5.52	6	5.56	12.86	7	6.48	10.50
	Haryana	14	227	76.95	7.70	43	14.58	15.00	25	8.47	14.00
	Maharashtra	13	184	78.97	5.96	37	15.88	9.41	12	5.15	10.08
	Karnataka	15	164	76.20	5.00	29	13.48	8.00	22	10.20	9.00
	Kerala	15	169	94.94	5.00	9	5.06	10.0	-	-	-
	Tamil Nadu	10	62	46.96	4.10	70	53.04	6.90	-	-	-
EVS I	Assam	16	186	68.13	7.40	35	12.80	11.56	52	19.05	12.74
	Haryana	12	262	79.60	8.60	42	12.80	15.50	25	7.60	16.00
	Maharashtra	21	392	90.32	3.29	31	7.14	10.87	11	2.53	11.00
	Karnataka	13	132	78.57	6.00	8	4.76	9.00	28	16.67	12.00
	Kerala	10	43	79.60	5.00	10	18.50	8.00	1	1.80	11.00
	Tamil Nadu	8	65	52.40	4.60	59	47.60	7.30	-	-	-
EVS II	Assam	14	157	52.33	5.86	103	34.34	10.23	40	13.33	7.27
	Haryana	11	186	73.20	9.00	49	19.20	11.00	19	7.50	20.00
	Maharashtra	12	156	78.78	6.97	31	15.66	10.00	11	5.56	10.29
	Karnataka	13	135	73.37	5.00	17	9.24	7.00	32	17.39	7.00
	Kerala	10	102	91.97	5.00	9	8.03	8.00	-	0.9	-
	Tamil Nadu	8	66	56.90	6.90	50	43.10	7.10	-	-	-
Maths	Assam	28	96	59.66	5.21	34	21.12	0.30	31	19.25	12.35
	Haryana	12	134	69.00	7.70	33	17.00	15.00	27	14.00	16.00
	Maharashtra	18	237	70.96	5.52	90	26.95	15.70	7	2.09	9.57
	Karnataka	14	94	78.99	4.00	12	10.08	8.00	13	10.93	10.00
	Kerala	9	243	97.98	7.00	5	2.02	15.00	-	-	-
	Tamil Nadu	14	34	48.60	3.60	36	51.40	6.50	-	-	-

Avg. No. Wds = Average Number of Words

from 6.90 in the Tamil textbook to 15.00 in Haryana textbook. In compound sentences length ranges from 9 words in Karnataka textbook to 14.00 in Haryana. To probe further into the factor of sentence type and sentence length vis-a-vis children's performance, a comparison was made of the two states' textbooks was found to be the highest (Maharashtra) and the lowest (Haryana) on readability as per children's means scores (Table 6). It seems that the two factors which may have some bearing on lowering the readability level could be the higher usage of compound sentences (8.47) and higher average sentence length (7.7, 14 and 15 for simple, compound and complex sentences respectively) in Haryana textbooks. This becomes particularly relevant against the backdrop of the pattern evident in Class III children's spontaneous language (Sharma, 1993) where the percentage of compound sentences used is only 4.06 and average sentence length for simple sentence (spoken and written) is 4.65. Maharashtra sentence pattern is closer to this and is therefore possibly more conducive to higher readability. Though, it is assumed here that the pattern of language behaviour of Class III children in Rajasthan may be indicative to some extent of language pattern of grade III children in other parts of the country "the need to compile state/region-wise norms of children's language pattern cannot be over-emphasized."

An analysis of teachers' views indicates that majority of teachers graded the language textbook as relatively easy. Interestingly their quantitative estimation of percentage of children finding the book as easy/difficult was inconsistent with their own grading of the textbook. In terms of modality of The use of textbooks it was interesting to observe that language textbook is the only one which teachers read directly to children and also get the children to read from it in the conventional *Path Pado* (read the lesson) method. Some specific suggestions given by the teachers for improving the readability of language textbook were that the number of lessons in the textbook should be reduced and rearranged in the order of difficulty and composite words and complex sentences should be minimised.

### *Environmental Studies I and II Textbooks*

From the results of comprehension tests (Table 2) it can be observed that the comparative picture emerging for readability of EVS I textbooks appears similar to that for language textbooks with Karnataka and Haryana textbooks demonstrating lower readability. More than 60 per cent of the students scored less than 50 per cent in these states, demonstrating a negatively skewed distribution. For Maharashtra, Kerala, Tamil Nadu and Assam distributions are positively skewed with 25 per cent to 40 per cent children scoring over 75 per cent.

EVS II textbooks for Tamil Nadu and Maharashtra show high readability (42 per cent to 61 per cent children scoring above 75 per cent). For Haryana and

Karnataka the distributions are extremely negatively skewed with 80 per cent to 90 per cent of the sample scoring below 50 per cent indicating a very low level of readability. The textbooks of Kerala also do not appear to be pitched at the desired level since over 50 per cent of the sample has scored less than 50 per cent.

Analysis of area-wise differences in readability of EVS I and II textbooks indicate fairly high readability for the urban sample of Assam, urban and rural samples of Tamil Nadu, tribal sample of Kerala and rural and tribal sample of Maharashtra. For the other sub-groups in all the six states readability is towards the lower side. Situation is particularly disturbing for Karnataka where it is low for all the three sub = samples. EVS II textbook appears to be generally of a higher difficulty level consistently across all states.

Data obtained for content analysis of EVS I and II textbooks from six states indicate that in terms of "vocabulary" (Table 3) the pattern remains more or less similar to that discussed under language. The points discussed there are thus applicable to EVS I and II as well. Maharashtra and Haryana deviate slightly from this set pattern with percentage of adjectives being higher than that of verbs but evidently this does not in any way affect the readability level of the textbook since both Haryana and Maharashtra textbooks are at two extremes as per the children's performance. However, the relatively higher percentage of adverbs used in EVS I and II textbooks in Haryana could be a factor adversely affecting the readability. This needs further probing. Table 4 gives relative percentages of different types of sentences used in EVS I and II textbooks. Generally a consistent pattern is emerging — maximum use of simple sentences (52.4-91.97) followed by complex sentences (4.76-47.6) and then compound sentences (0.9-19.05). In Tamil Nadu and Kerala textbooks for EVS I and II no compound sentences were reported. In Assam and Karnataka, however, the pattern deviates with the percentage of compound sentences being higher than the complex sentences in EVS I textbook. In EVS II textbook this is seen only in the case of Karnataka. From the data available on sentence type no simple linear relationship seems evident.

Coming to average length of sentences if we consider the data of two extreme states as per children's performance, i.e., Haryana and Maharashtra, the consistently higher average length of sentences is evident for Haryana with compound sentence length of 20 words in comparison to 10.2 in Maharashtra. Sentence length, therefore, could be a potential factor in readability which needs further probing.

EVS I textbook was generally perceived to be easier by teachers across the states. The EVS II textbook was rated as difficult. The modality of textbook use for EVS I and II was different from that of language textbook. Most teachers reported these books being used as guides. They teach from them using their own vocabulary rather than textbook language. Some suggestions given by teachers

for improving the textbooks of EVS I and II included simplification of words, concepts and terms, inclusion of more experiments, maps and illustrations, reduction in number of lessons and quantum of information and increase in exercises for children.

## *Mathematics Textbooks*

As indicated in Table 2 the comparative picture demonstrated a highly negatively skewed distribution for Haryana and Karnataka, 88 per cent and 64 per cent scoring less than 50 per cent. On the other hand, in Maharashtra over 50 per cent of the sample has scored more than 75 per cent marks, followed by Tamil Nadu 47 per cent, Assam 40 per cent and Kerala 31 per cent. The textbooks are the other three states appeared to be high on readability. Maharashtra's mathematics textbooks is almost on the easier side. Area-wise differences reflect mathematics textbook to be readable for all the sub-groups in Assam, for the rural and tribal sub-groups of Maharashtra and Kerala, and urban sample of Tamil Nadu. The picture is most disturbing for Haryana and Karnataka, where mathematics textbook did not cater to linguistic levels and needs of any of the sub-groups.

Content analysis as per Vocabulary (Table 3) and Syntax (Table 4) revealed that pattern of vocabulary usage and sentence type for mathematics is more or less consistent with Language and Environmental Studies I and II. The only deviation for sentence type was in the Karnataka textbooks which used equal number of complex and compound sentences. The only notable aspect that emerges is the wide range across states in the use of compound sentences, 2.09 in Maharashtra (highest readability as per children's performance) to 10.93 in Karnataka, 14.0 Haryana and 19.25 Assam which are towards the low extreme. Greater use of compound sentences would logically lower the readability of the book, depending on children's level of language competence. Coming to the average length of the sentence the data across the state does not indicate any marked deviation which could have a bearing on textbook readability.

As per the teachers' comments, mathematics textbook was reported to be difficult in most cases. Modality of use of the mathematics textbook by the teacher was more in the form of a guide. Only 20 per cent of them reported it as being used directly by the children and that too for home assignments.

## *Writing and Reading Test*

Table 6 shows a consistent trend across the states with the reading scores being higher than the scores on writing. Apparently, the skill of reading is more holistic in nature as compared to writing skill. As observed during the course of test administration, even in cases where words were written incorrectly they were read



TABLE 6

## Children's Writing and Reading of 10 Most Frequently Occurring Words in Textbooks

Subjects	Total Words	Average No. of 10 most frequently occurring words correct										Average No. of 10 most frequently occurring words correct									
		Writing										Reading									
		Urban										Urban									
		AS	HR	MH	KA	AS	HR	AS	HR	Tribal	AS	AS	HR	MH	KA	AS	HR	Rural	AS	HR	Tribal
Language	10	8	8	8	5	6	6	6	5	5	9	9	10	10	8	8	8	8	8	8	6
Mathematics	10	8	8	8	4	6	6	6	5	5	9	9	9	10	8	8	8	8	8	8	7
Environmental Studies	10	8	7	6	4	6	6	5	6	6	9	9	9	9	8	9	8	9	8	8	7
Total	30	24	23	22	13	18	17	16	16	16	27	27	28	29	24	25	24	24	25	24	20

State = AS -- Assam, HR -- Haryana, MH -- Maharashtra, KA -- Karnataka,  
 State Language = Assamese, Hindi, Marathi, Kannada

correctly on the basis of the clues provided by the first few alphabets. However, an important point worth noting is that this occurred only in the case of words already existing in the child's own vocabulary. It appears that the familiarity factor facilitates reading. This only further endorses the need for textbook language to be as close to the child's vocabulary as possible. The scores on writing are consistently lower than those for reading, reflecting it to be a more complex skill, involving more of an analytical than synthetic approach.

### IS THERE PARITY ACROSS TEXTBOOKS?

Language, EVS I and II and mathematics textbooks would necessarily differ in their structure and approach, since each has a specific objective and scope. While the language textbook primarily aims at development of basic linguistic competencies at the primary level, the EVS and mathematics textbooks are more content oriented. Yet, it is expected that there will be some parity in terms of their difficulty level, particularly with respect to language use. This is necessary if they are prepared keeping in mind the abilities and background of the target group.

When we consider the comparative readability of textbooks for each subject state-wise (Table 7 and 8) variations within subjects are very evident. But the trend of variation is not consistent across the states. In Assam, there is little parity between language and other textbooks in terms of level of language comprehensibility. Significant difference were observed across the subjects excepting EVS I and II with mathematics. In Haryana, while the language and EVS I textbook are more or less at par, the means for EVS II and mathematics reflect much lower

TABLE 7  
Subject-wise Children's Performance on Readability Tests

Subjects		Assam	Haryana	Maharashtra	Karnataka	Kerala	Tamil Nadu	Total
Language	N	146	144	280	180	130	130	1010
	Mean	29.25	17.89	32.5	18.65	24.54	24.96	25.48
	S. D.	8.29	11.89	7.84	9.95	12.36	12.2	10.46
EVS I	Mean	11.15	8.40	13.37	8.42	11.03	15.25	11.40
	S. D.	4.81	5.48	5.25	4.62	6.08	5.04	5.69
EVS II	Mean	12.86	5.92	14.31	6.93	10.24	14.92	11.14
	S. D.	4.39	3.77	4.15	4.59	5.46	5.01	4.85
Maths	Mean	11.91	6.15	15.12	9.06	12.79	14.07	11.86
	S. D.	5.85	3.65	3.82	4.92	4.09	5.81	5.61

M. M. = Maximum Marks

# READABILITY ASSESSMENT OF PRIMARY LEVEL TEXTBOOKS

TABLE 8

Significance of Difference (t-value) Across the Subjects on Children's Performance

Subject	Assam	Haryana	Mahara-shtra	Karna-taka	Kerala	Tamil Nadu	Total
Language and EVS I	6.6**	0.82	11.45**	1.98	1.6	4.03**	5.51**
Language and EVS II	3.5**	5.16**	5.69**	4.75**	2.81**	3.56**	7.12**
Language and Maths	11.6**	4.8**	3.45**	0.51	0.8	2.17**	3.6**
EVS I and EVS II	3.16**	4.47**	2.35**	3.72**	1.1	0.53	1.1
EVS I and Mathematics	1.27	4.1**	4.5**	1.2	2.74**	1.75	3.08**
EVS II and Mathematics	1.5	0.53**	2.4**	5.57**	4.26**	1.26	1.83

\*\* P < .01

level of readability. Although the situation in Maharashtra as reflected in the mean percentages appears more consistent in terms of high level of readability yet, significant differences were observed on mean values across subjects. In Karnataka, while readability of all textbooks appears on the means for the language reader are the highest and that for the EVS II textbooks the lowest and these differ significantly from other subjects. Data from Kerala also reflects a fair amount of consistency in terms of level of readability with the means ranging between 51.2 per cent for EVS II and 63.95 per cent for mathematics. Language readability is at par with mathematics and EVS I. Interestingly, Kerala is the only state where mathematics textbooks has the highest means score demonstrating significantly higher readability than EVS I and II. Tamil Nadu again becomes a notable exception with its language reader having the lowest readability (mean 62.4 per cent) and differing significantly from other subjects. This is followed by mathematics textbook (70.35 per cent). EVS I textbook has the highest readability with mean percentage of 76.25 per cent.

The Vocabulary pattern followed by most states as indicated in Table 3 reflects some minor inconsistencies across the subjects' textbooks. However, there does not seem to be any obvious impact of these inconsistencies on readability of textbooks across the subjects.

The comparative analysis of sentence usage in different subjects as indicated in Table 4 does not again give any clear-cut trends. However, an interesting

observation is that in Tamil Nadu the language textbook which is showing lowest readability as per children's performance has the highest percentage of complex sentences across all textbooks. As a matter of fact for mathematics and language the percentage of complex sentences used is higher than the simple sentences which could logically lower readability. Among the Kerala textbooks, the mathematics textbooks, which demonstrated high readability as per children's performance also has the highest ratio of simple sentences. These observations hint at the possible facilitative influence of greater use of simple sentences enhancing readability. At the same time the lack of any consistent trend indicates the possible interactive/additive effects of various other factors which in combination with sentence type could affect the readability of texts.

Teacher's perception regarding relative difficulty of different textbooks in terms of readability indicate a tendency to rate mathematics and EVS II books as more difficult. Differences across subjects stand out particularly in the context of modality of using textbook by the teachers. While the language book was read by them in majority of cases directly to children and also by children, the EVS I and II textbooks are read by teachers who explain the content in their own words to the children. The mathematics textbook is treated more as a reference book from which problems are taken for demonstration by teachers on the blackboard. The textbooks are used by children only for exercise to be conducted by the children for home assignment.

*Investigators' Observations :* The overall rating of mathematics and EVS II textbooks as more difficult may be attributed to the inclusion of technical/complex terminology and high level concepts which may not have been paraphrased in adequately simple language. Consequently, often the teachers themselves are not familiar with the terminology. Even if they are, the complexity of terminology deters them from using these terms in the class. Textbooks for EVS II and mathematics therefore apparently do not lend themselves to varied usage by children without the intervention of teachers. While the teachers' intervention can be undoubtedly facilitating, this total dependence on the teacher input may not be very conducive to self-learning or learning by discovery/experimentation on the part of children. It may also create some amount of message dilution depending on the quality of teachers' interpretation of the relevant matter/content. Also, in the context of the existing multigrade situation in schools in the country the need for self-learning instructional material is crucial and the textbook writers should attempt to meet this need. In this context, procuring regular feedback from classroom situations becomes imperative for the writers of textbooks.

## METHODOLOGICAL ISSUE : APPLICATION OF READABILITY FORMULAE

With respect to Application of Readability Formulae it was observed that the Fog Index value as calculated for the language textbook fell much beyond the

considered age for Hindi language in the present study and also of Agnihotri and Khanna, 1993, and does not appear to be workable at all for Kannada, Marathi and Malayalam textbooks. This may be due to the polysyllabic nature of these languages which tends to shoot up the index value in a distorted way. The application of readability formulae on Indian textbooks thus needs to be undertaken with caution

## **Implications**

The following implications have emerged from the results and discussion with respect to textbook preparation, teacher training in use of textbooks and methodological aspects of readability measurement.

### *Textbook Preparation*

- To ensure continuity and parity in terms of level of readability, there is need to maintain better coordination and interlinkages between different subject textbooks for a particular grade and between textbooks of preceding and succeeding grades.
- To improve readability of the Mathematics and EVS textbooks the possibility of introducing their technical vocabulary alongside, through the language textbooks of the preceding or same grade in a more comprehensible and interesting way, needs to be explored.
- There should be greater involvement and participation of language experts or writers in the preparation of textbooks to ensure parity in terms of language usage.
- Textbook writers of Mathematics and EVS should review their emphasis on use of technical vocabulary right from the early primary level. Interaction with textbook writers gave indication of this emphasis, while teachers in practice were observed to be using their own terminology which they believed was more comprehensible to children, without exposing them to the given terms.
- Textbook writers should therefore also maintain closer interaction with teachers and conform to a regular cycle of feedback.
- EVS II and mathematics textbooks were generally observed to be low on readability as compared to the language and EVS I textbooks. These should therefore be prepared using simpler language, a more interesting format and more activity-based exercises with a view to enhance their readability and usability.
- The study highlighted differential modes of use of textbooks, with EVS and mathematics textbooks being used more by teachers as reference books or

guides. The Language Reader was used directly by children. These textbooks should therefore be reviewed and prepared also with a view to promote self-learning by children, particularly in the context of widely practised multigrade teaching and high pupil-teacher ratio in schools.

- Use of familiar vocabulary was observed to be a facilitating factor in acquisition of reading skills. In this context, there is a need to compile children's vocabulary for different grades on regional/state basis which could be used as a bench=mark for textbook preparation.
- Greater use of complex/compound sentences and lengthy sentences were observed to raise the difficulty level of the text. While these may not be direct predictors of readability, they seem to be crucial in interaction with other factors. In this context, specific guidelines need to be prepared for textbook writers keeping in view the possible impact of language used, particularly in terms of Syntax.

#### *Teacher Training*

- During inservice training, interactive sessions between textbook writers and practising teachers should be provided for, which would be of mutual benefit in terms of acquainting teachers with the writer's perceptions regarding modality of use and providing feedback to writers for textbook revision.
- Training programmes, both preservice and inservice, should also consider the development of sensitivity among teachers towards the need and ways of carrying out effective and ongoing evaluation of the teaching-learning process including the instructional material. In the context, teachers may be familiarized with curricular-based assessment procedures to facilitate evaluation.

#### *Methodology for Readability Measurement*

- Readability studies should be conducted with a more comprehensive design including aspects like legibility of print, illustrations, idea density etc for more detailed analysis and recommendations for textbook preparation.
- Thematic content analysis of textbooks is also necessary along with the linguistic analysis for ensuring inclusion of necessary inputs in textbooks for facilitating mastery of minimum levels of learning in the target group.
- Readability formulae available in literature should be attempted with caution for Indian Languages since the highly polysyllabic nature of Indian languages makes the validity of these formulae doubtful.

## READABILITY ASSESSMENT OF PRIMARY LEVEL TEXTBOOKS

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# Designing, Production and Distribution of Instructional Materials

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## ABSTRACT

*This is a concise report of the study undertaken by the Publication Department of the NCERT on Designing, Production and Distribution of Instructional Materials in few select States. This report briefly describes the methodology adopted for collecting the information; the findings based on the information collected, and the recommendations for improvement in designing, production, and distribution of instructional materials.*

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## Introduction

Printed textbooks and other instructional materials have been and, in spite of the advent of the electronic media, will continue to occupy an extremely important place in the teaching-learning process in the schools in India. The much-publicised paperless (and bookless) society has not, mercifully, emerged as a practical alternative in the educational scenario in the schools. On the other hand, the number of titles, the number of copies of these titles and the number of pages have registered significant increase in recent years, not to mention the greater use of colours. These have strained the resources of the agencies responsible for publishing these textbooks, calling for managerial skills, generally associated with mass production of consumer and other goods, which, unfortunately, were either not available in the book industry or, if available, were not taken advantage of.

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The present study has been taken from the document *Research Based Interventions in Primary Education : The DPEP Strategy* (1994), National Council of Educational Research and Training, New Delhi.



Furthermore, textbook publishing on a mass scale has not been recognised even today, barring a few exceptions, as a specialised, technical process, requiring the employment of trained, professional technologists and specialists in the fields of editing, designing, production, storage and distribution. State after state and agency after agency have requisitioned the services of existing administrative personnel, who have stumbled through the maze of typesetters, processors, printers, binders and book retailers. Some of them acquired a little insight, while the remaining majority refused to learn the intricacies of book production. All this resulted in poorly illustrated, ill-designed and indifferently produced textbooks.

However, the two strong points of such textbooks were the reasonable prices (since most of the agencies operated on a 'no-profit-no-loss' basis or the government subsidised the costs of production) and the contents, which were more relevant to Indian ethos, as compared to the earlier textbooks.

### **Objectives of the Study**

The Publication Department (PD) of the National Council of Educational Research and Training (NCERT) was entrusted with the task of undertaking a study on Designing, Production and Distribution of Instructional materials in select states under the District Primary Education Programme (DPEP). These states were: Assam, Haryana, Karnataka, Kerala, Maharashtra, Madhya Pradesh, Orissa and Tamil Nadu. The studies in six states have been completed and preliminary reports have been approved by the concerned states. However, the progress in the case of Madhya Pradesh and Orissa has been slow and the reports are yet to be drafted.

The objectives of the study were:

1. To assess the present status of designing, production and distribution of instructional and NFE materials in the states covered by the SSN and DPE projects
2. To suggest improvements/modifications, wherever necessary for each area
3. To suggest professional and technical training of the personnel, in view of technological advances

### **Methodology**

The required data was collected from each state through a main questionnaire, which was filled in by the respective Nodal Officers in consultation with the respective member of the Sub-Core Team. Thereafter two sub-questionnaires were filled in by the respective surveyors, on the basis of the surveys conducted to

ascertain : (i) the availability of books, and (ii) paper and infrastructure for printing, etc. in the state. The information thus collected was analysed by the Study Team and discussed with the respective Nodal Officers. Printed books were collected from each state and were examined by a team of experts, to assess the physical qualities of the books for different classes/stages under five categories namely, typography, illustrations, printing, binding and paper, as well as the overall rating.

### Findings

1. Generally, more than one agency is involved in the overall publishing of the textbooks. This has often resulted in lack of coordination and the different agencies have tended to follow different mechanisms.
2. Resources and finances are major problems for almost all agencies. Borrowing money from banks at high interest rates seriously affects the financial standing of the agencies
3. Some agencies depend only on government presses for the printing of the books while other agencies confine the printing jobs to printers within their state only. In the former case, printing has been delayed and in the latter case, the printing rates have been quite high.
4. Except for a couple of agencies, the distribution of the printed books has been seriously delayed, leading to criticism and dissatisfaction
5. Distribution of free books is a major problem as often such free books do not reach the target group or reach very late. Further, the reimbursement on account of such free books is generally delayed with the result that the agencies face financial crunch.
6. Almost all the agencies suffer from the lack of professionally trained personnel in all the areas of book publishing.
7. In-house facilities for lasersetting, artwork preparation, designing, etc. are non-existent.
8. The physical qualities of the books need considerable improvement in almost all cases
9. The agencies are not functionally autonomous with the result that they have to await decisions and approval from elsewhere
10. The agencies and their various outlets do not have modern communication facilities and hence monitoring becomes difficult and cumbersome
11. The rates of payments to authors, illustrators, editors, proof readers, etc., are poor.
12. The agencies have no control over the frequent changes made in the textbooks and, therefore, the quantities printed are sometimes less than the required number.

### **Recommendations**

1. Multiplicity of authorities for decision-making should be avoided.
2. The agencies should be provided with sufficient working capital or a rolling fund so that they do not have to borrow money at commercial rates. One-time interest-free loan, to be paid back in a specified time, could be another alternative.
3. Printing rates should be obtained from a wider cross-section of printers so that there is an element of competition, which would result in lower rates and help the agencies in further lowering the sale prices.
4. Inventory control and distribution have to be modernised and made more efficient. The book trade should be associated with such distribution so that the pressure on the storage space will be eased and the books will be more easily available throughout the states.
5. The agencies should not be burdened with the cost of free books. The concerned state government should pay the money to the agencies, in advance, and evolve a mechanism so that such free books do not remain in the offices/godowns of the government offices.
6. Urgent steps should be taken to train the existing staff in modern techniques of publishing and, wherever feasible, fresh professionally trained staff should be recruited.
7. The agencies should instal in-house facilities for lasersetting, illustrations, designing, etc.
8. The physical qualities of the books should be improved by engaging freelance artists, designers, typographers, editors, production personnel, etc.
9. The agencies should be made functionally autonomous but with sufficient checks and balances.
10. Modern communication facilities should be provided.
11. The rates of payments to authors, illustrators, editors, proof readers, etc. should be periodically revised.
12. The textbooks once prescribed should continue for a minimum period of three years, unless there are compelling reasons to revise/replace them. This will enable the agencies to plan their printing programme more satisfactorily.

# State Finances for Education

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## ABSTRACT

*A brief profile on the pattern of financing of elementary education in each state during the post-Independence period, especially in the eighties and nineties has been attempted. The paper presents a brief idea of the extent of financial resources required for universalization of elementary education by the year 2000 AD and the gap between the requirements and the likely resources. The findings have been discussed and the conclusions arrived at have been presented.*

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## Introduction

As a part of the District Primary Education Programme (DPEP), several baseline studies on various aspects relating to primary education have been conducted at district and state levels. These studies assume crucial importance in formulation, execution and evaluation of the projects. An important area of study refers to state finances for education. Studies on state finances would be very valuable and serve several purposes including the preparation of the district level plans, providing valuable inputs into the planning process and for *ex-post* evaluation of the DPEP by facilitating analysis of the additive versus substituting nature of the funds of the project.

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The present study has been taken from the document *Research Based Interventions in Primary Education . The DPEP Strategy* (1994), National Council of Educational Research and Training, New Delhi.

It was the intention of the national core team to build up state level capacities in preparing such studies, and accordingly the studies were conducted by the state government officers themselves, and the role of the members of the sub-group of the national core team was confined to providing guidance and expert advice in the preparation of the studies. A couple of workshops were organised at NIEPA in the context of these studies, one at the commencement of the studies, and the latter towards the end for the finalisation of the studies. In addition, a few visits were made to the states during the conducting of the studies.

Studies on state finances have been conducted in six states (Assam, Haryana, Karnataka, Kerala, Maharashtra and Tamil Nadu), that provide a statistical, descriptive and analytical profile of the pattern of financing of education (particularly elementary education: primary and upper primary), and projections - on the financial requirements of elementary education in each state, if elementary education were to be universalised by the turn of the century.

### Objectives

The main objectives of the studies on state finances for education are :

1. To present a brief profile on the pattern of financing of education, particularly elementary education — primary and upper primary education — in each state during the post-independence period, concentrating on the 1980s to the present (1980-81 to 1992-93).
2. To present a brief idea of the extent of financial resources required for education (for universalisation of elementary education by 2000), and of the gap between the requirements and likely availability of resources.

The focus of the studies is on objective 1, and is on elementary education (primary and upper primary levels), though some important details on other and all levels of education as a whole were also to be given.

Originally a detailed structured outline of the studies was provided to the state governments as a suggestive framework for the studies. Finally, the state governments, on the advice of the Department of Education, Ministry of Human Resource Development, adopted the study prepared in the context of the Basic Education Project in Uttar Pradesh as a model format. It resulted in a somewhat uniform method of presentation of the studies by the several states, though there are a few differences in the presentation of details.

The main aspects identified for the studies were : (a) trends in financing education, including allocation of resources, priority given to education in the five year plans (outlay/expenditure on education as per cent of the total plan outlay/

expenditure), plan expenditure/outlay on education during the seventh and the eighth five year plans, growth in non-plan expenditure on education, expenditure on centrally sponsored schemes, intra-sectoral allocation of resources, inter-functional allocation of resources (expenditure by objects), and (b) requirement of resources for universalisation of elementary education up to the turn of the century, based on unit costs of education (expenditure on education per student) and projected enrolments with the target of universalising elementary education by the turn of the century.

It is obvious that the costing and financing of the DPEP have not been a part of the studies on state finances for education. Accordingly, the studies could not refer to a couple of important issues such as sustainability (how far will the projects being launched now with the help of external assistance be sustainable after the end of the project), and additionality (how far will the project funds be additional to the domestic finances being made available for education). Originally it was intended that the studies would provide some idea on sustainability of the projects, and additionality of the external funds. But due to data and other constraints, these two issues could not be discussed in the studies.

### Findings

A few important findings reported in the studies are as follows :

1. Except Maharashtra, the budgetary conditions in the recent years, in all the other five states are characterised by almost continuously increasing deficits (in revenue account). One expects these adverse general budgetary conditions to have serious effects on education budgets. But no proper correspondence could be found between general budgetary conditions and education budgets, suggesting as if budgets for education are not affected by budget deficits.
2. Except in case of Kerala and Tamil Nadu, the priority accorded to education in the five year plans has increased significantly between the seventh and the eighth five year plans. (But the increase might be smaller than the increase between the sixth and seventh plans; the latter is attributable to the National Policy on Education, 1986). The increase in Assam to 19 per cent in the eighth plan from 8 per cent in the seventh plan is not 'real', as plan outlay/expenditure in the eighth plan is meant for meeting non-plan expenditure as well.

In Kerala the share of education in the eighth five year plan expenditure/outlay was almost the same as in the seventh five year plan (3.7 per cent), and in the case of Tamil Nadu it has declined from 7.2 per cent in the seventh plan to 3.6 per cent in the eighth plan, though in absolute terms, the allocations have increased.

3. Intra-sectorally, the relative priority accorded to elementary education also increased significantly in all cases, except in Tamil Nadu, between the seventh and the eighth five year plans, which is in response to the resolve made in the National Policy on Education 1986 to increase allocations for elementary education. In Karnataka, the share of elementary education in the total plan expenditure/outlay for education increased from 38 per cent in the seventh plan to more than two-thirds in the eighth plan. In Tamil Nadu, the change is in negative direction, but the quantum of change is marginal.
4. In the allocation of non-plan expenditure on education also, elementary education receives a high priority, receiving nearly half of the total in case of almost all the six states. However, between 1990-91 and 1991-92, the two latest years for which data are available, there is a marginal decline in the corresponding proportions, and the decline is steep in case of Assam (from 59.03 per cent in 1990-91 to 54 per cent in 1991-92); and in Karnataka there is a marginal increase. In the other states, the proportion remained relatively unchanged.
5. The recent trends in the grants to the states for centrally sponsored schemes for elementary education have not been systematic. During the last seven or eight years, such grants have increased in Assam, but declined in case of Haryana, and there were zigzag trends in case of other states. Grants for centrally sponsored schemes in adult education have declined in Assam, Haryana, Kerala and Tamil Nadu, and the trends are not smooth in Karnataka.
6. Understandably, the growth in plan expenditure on elementary education in Kerala during the 1980s has been negative not only in constant prices, but also in current prices due to declining age-group population and correspondingly declining enrolments.
7. Even the modest estimates of resource requirements based on projected enrolments and unit cost of education in the early 1990s, seem to be huge in most states. It is only in Kerala, the required rate of growth in enrolments is negative for universalisation of elementary education by 2000. Therefore, the resource requirements of Kerala are found to be not huge; but for improvement in quality of education it is felt that additional resources will be required in Kerala too. In real terms (i.e. at constant prices) the annual rate of growth required in resources is more than 7 per cent in most states (7.7 per cent in Karnataka, 12.8 per cent in Tamil Nadu, and nearly 20 per cent in Assam) during the remainder of the 1990s.

## Conclusion

To conclude, the several studies highlight the following :

- There exist wide variations in the levels of expenditure (total, per student, and percentage proportions) on education, particularly elementary education among several states. That there are no norms (either at the central or state level) regarding the proportion of state income (SDP : state domestic product), plan outlays or budgets that need to be allocated for education, and in education for elementary education might partly explain the inter-state variations.
- The trends in the growth in expenditure on education are not smooth.
- There is a significant increase in the central expenditure on elementary education in the recent past in several states.
- There are also wide variations in the grants for centrally sponsored schemes, and the growth in the same is not systematic.
- The salaries of the teachers and other staff consume the largest proportion of the budget, leaving little amounts for other items; in some states (e.g. Karnataka) expenditure on incentives is sizeable.
- The requirements of capital nature are important, and they seem to be high.
- Lastly, no such attempts were made earlier by the state governments to analyse the trends in state finances for education in the states. But the importance of these studies is well recognised both in the context of DPEP in particular, and in the context of educational planning in general.

TABLE I  
Share of Education in Total State Plan Expenditure/Outlay  
(per cent)

<i>State</i>	<i>Seventh Five Year Plan</i>	<i>Elghth five Year Plan</i>
Assam	10.90	19.00
Haryana	5.30	7.10
Karnataka	4.25	8.80
Kerala	3.76	3.70
Maharashtra	2.50	3.90
Tamil Nadu	7.18	3.62



TABLE 2

Share of Elementary Education in Total Plan Expenditure/Outlay on Education (per cent)

<i>State</i>	<i>Seventh five Year Plan</i>	<i>Eighth Five Year Plan</i>
Assam	49.30	59.30
Haryana	46.96	49.73
Karnataka	38.33	66.42
Kerala	18.00	21.00
Maharashtra	28.47	39.45
Tamil Nadu	51.38	50.49

TABLE 3

Share of Elementary Education in Total Non-Plan Expenditure on Education (per cent)

<i>State</i>	<i>1990-91</i>	<i>1991-92</i>
Assam	59.30	54.00
Haryana	46.11	45.34
Karnataka	50.41	51.71
Kerala	52.50	51.00
Maharashtra	45.52	45.50
Tamil Nadu	—	51.00

TABLE 4

Trends in Expenditure on Centrally Sponsored Schemes in Elementary and Adult Education (1985-86 to 1991-92)

<i>State</i>	<i>Elementary</i>	<i>Adult</i>
Assam	Increasing	Decreasing
Haryana	Decreasing	Decreasing
Karnataka	Zigzag	Zigzag
Kerala	Zigzag	Decreasing
Maharashtra	Zigzag	Zigzag
Tamil Nadu	Zigzag	Zigzag

# STATE FINANCES FOR EDUCATION

TABLE 5

**Required Real Rate of Growth in Expenditure on Elementary Education to Provide Universal Elementary Education by 20000 (per cent)**

<i>State</i>	<i>Annual Growth Rate</i>
Assam	23.66
Haryana	8.00
Karnataka	7.70
Kerala	—
Maharashtra	9.00
Tamil Nadu	12.80

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## *Vagvad* — A Forum of Peers

We intend to start a column in the forthcoming issues of our journal to encourage debate, discussion, presentation of opinions on the various issues concerning educational research and innovations. Readers are also welcome to express their views regarding the research papers and notes published in this journal. Rejoinders from the authors about the reactions towards their papers would also find a place in the proposed column.

EDITORS

# Cognitive Negotiability\* of Bastar Boys

A.C. PACHAURY

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### Abstract

*The data for this study were collected from five boys each of the Halba-tribe and non-tribal group aged 9 years 2 months to 12 years 4 months of Nayeekguda village of Bastar district (Madhya Pradesh). Each subject was administered five Piagetian conservation tasks in the fixed order of number, continuous and discontinuous lengths, and quantities by the author. The Omega statistic ( $w$ ) revealed that there does not exist any significant difference between the boys of these two categories on the conservation tasks, except that on the discontinuous length conservation, the non-tribal boys performed significantly better than their tribal peers ( $w=0.95, p<.05$ ). The two groups of boys also do not differ in the pattern of explanations advanced by them on the five conservation tasks (all  $w$ 's are insignificant at .05 level). Suggestions for curriculum development on the basis of their ability to negotiate Piagetian conservation tasks have been made for the disadvantaged target groups.*

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COGNITION implies knowing and conservation<sup>1</sup>. It is a special case of knowing by the individual, when the properties like the number, length and weight, etc. remain unchanged "in the face of certain transformations" (Javell, 1963).

---

\* Like the constructs of an aptitude, creativity, intelligence and motivation, etc. the concept of cognitive negotiability is inferred by the existence of behavioural manifestation of a subject on the Piagetian conservation tasks of number, continuous and discontinuous lengths and quantities.

Piaget (1952) considers "conservation as a necessary condition for all rational activity". Culture not only controls but as well conditions learning and living styles of its peoples. In food gathering societies, they are embedded into survival skills like hunting, self-defence and self-propagation. Cultures are above this level, but otherwise do not go beyond the maintenance levels. Tribal people of Bastar, in general, can be put in the maintenance category, because most of them are still just continuing a life style that keeps their self-preservation and self-propagation only. Although the Bastar tribal children might be going to school, yet their learning modes are basically hinged to their cultural demands. Hence, Bastar tribal children would be concrete thinkers in their dealings. To test their hypothesis, boys of the Bastar (the Nayeekguda village) were interviewed on five Piagetian tasks to ascertain their cognitive negotiability of conservation.

### Sample

On the day of data collection, five 'halba' tribal boys were present in the school. It is a boys' middle school run by the Education Department of the Madhya Pradesh State. According to the school register the age of these students ranged from 9 years 2 months to 12 years 4 months. Five non-tribal boys with equivalent ages within  $\pm 3$  months were also located through school registers for the purpose of a comparison group. Teachers of the school confirmed that the non-tribal group was also equivalent to the tribal group on the variables of school achievement and socio-economic status of their parents. Both the group Ss were equally conversant with the use of spoken and written 'Hindi' language as well. The parents of these boys had been living and working in and around Bastar proper. The village of Nayeekguda is located within a kilometre radius from the main Bastar bus stand, located on the Raipur-Jabalpur highway.

### Data Collection

Data were collected through an interview technique. A structured questionnaire was used. Five Piagetian tasks were presented to each subject in the fixed order of the number, continuous length and quantity and discontinuous length and quantity.

### Method

A semi-clinical method was used for data collection. A halba teacher working in the middle school from which the Ss were drawn helped in creating rapport and whenever a need was felt, he also acted as surrogate experimenter.

The halba teacher explained the content of the task(s) to the subject in local/halbi dialect.

All those Ss who did not produce an explanation on the first instance were given two more chances after which the experimenter terminated the task. Details of these tasks are available elsewhere (Good, 1977; Pachaury, 1985a).

### Scoring

All the tasks were scored according to the procedure laid down by Piaget (1964). Each task involved three types of responses on the part of the subject.

1. An identity response has to be provided by the subject in yes or no category.
2. A transformation was effected on one of the stimulus pair and the subject had to judge the invariance of the attribute through yes or no category of response.
3. An explanation had then to follow the judgement response.

Explanations were categorized on the pattern suggested by Cathcart (1971) into the following:

1. *The substantive identity*: The subject referred to the original condition before the transformation was effected on one of the stimulus pair.
2. *The operative identity*: Nothing was added or subtracted from the transformed stimulus.
3. *Compensation*: Deals with the dimensional compensation of the transformed stimulus.
4. *Reversibility*: An identity condition is reached by reverting the transformation effected on a stimulus material.
5. *Perceptual*: It is related to description of the effect on the transformed stimulus material.
6. *No answer*: The subject did not offer any explanation.

### Results

#### (a) Conservation of Number

Only one tribal subject succeeded in conserving number. Three of them were non-conservers and one belonged to the category of the transitional stage (20, 60 and 20 per cent, respectively).

Three non-tribal Ss were conservers of number and the other two were non-conservers of it (60 and 40 per cent, respectively).

At an alpha of 0.05 level of confidence, a value of 0.84 is needed for Omega statistic<sup>2</sup>. But the calculated value of omega is 0.59, therefore, the

hypothesis of no 'significant difference between the two groups of Ss on the conservation of number' is accepted.

Forty per cent and twenty per cent Ss of both the categories advanced perceptual and substantive types of explanations, respectively. Hence, the two groups of the Ss do not differ between themselves on these abilities ( $w=0$ ,  $p > .05$ ).

The non-tribal Ss produced significantly more compensation explanations ( $w=.95$ ,  $p < .05$ ) and they also produced significantly less number of 'no answers' ( $w=.95$ ,  $p < .05$ ) than the tribal Ss.

#### *(b) Conservation of Continuous Length*

The same tribal subject who conserved number also conserved continuous length. Two of these Ss were in transitional stage, while the remaining two were non-conservers of continuous length (20 per cent, 40 per cent and 40 per cent respectively). For the non-tribal Ss, the individual conserved number as well as continuous length. One of these subject was in transitional stage, while the remaining were non-conservers of continuous length (20 per cent, 20 per cent and 60 per cent). There does not exist any significant difference between the two groups of the Ss on the conservation of continuous length ( $w = 0$ ,  $p > .05$ ). However, as regards the number conservation, the tribal Ss offered substantive identity as an explanation, while the non-tribal Ss offered compensatory explanation. Sixty per cent and 40 per cent respectively tribal and non-tribals did not advance any explanation for continuous length conservation and the two groups do not differ in this aspect ( $w = .30$ ,  $p > .05$ ). They also do not differ on compensatory explanation ( $w = .63$ ,  $p > .05$ ) and it is as well true for substantive identity explanation ( $w = .63$ ,  $p > .05$ ). However, non-tribal Ss significantly differed from their peers in making perceptual type of explanations ( $w = .95$ ,  $p < .05$ ).

#### *(c) Conservation of Discontinuous Length*

Three tribal Ss were non-conservers of discontinuous length, while the remaining two were in a transitional stage (60 per cent and 40 per cent respectively). Two non-tribal Ss were conservers of this task, the remaining three were its non-conserver (40 per cent and 60 per cent). Significantly more non-tribals conserved the discontinuous length task than the tribals ( $w = .95$ ,  $p < .05$ ). There does not exist any significant difference on the use of the compensatory, reversibility and substantive identity explanations by the Ss of these two groups (all the W's are .63,  $p > .05$ ). This is as well, true for not offering an explanation ( $w = .30$ ,  $p > .05$ ) and in making perceptual explanations ( $w = .30$ ,  $p > .05$ ).

*(d) Conservation of Continuous Quantity Of Matter*

Only one tribal subject conserved continuous quantity of matter. The remaining four were non-conservers (20 per cent and 80 per cent respectively). Two non-tribal Ss conserved this task, while the remaining three were its non-conservers (40 per cent and 60 per cent respectively). The tribal subject's explanation was substantive identity, while one each of the non-tribal subject gave explanation of substantive identity and compensatory types. However, there does not exist a significant difference in the performance of these two groups of Ss on the conservation of continuous quantity. Forty per cent of the Ss of each group gave perceptual explanations on this task ( $w = 0$ ,  $p > .05$ ). The groups neither differ on offering substantive identity explanations, ( $w = 0$ ,  $p > .05$ ), nor on compensatory explanations ( $w = .30$ ,  $p > .05$ ). They also do not offer any explanation at all ( $w = .30$ ,  $p > .05$ ).

*(e) Conservation of Discontinuous Quantity of Matter*

The only tribal subject, who conserved number and continuous length also conserved discontinuous quantity. The remaining four did not conserve this quantity (20 per cent and 80 per cent, respectively). Three non-tribals were conservers of this task, while the remaining two were its non-conservers (60 per cent and 40 per cent respectively). There does not exist any significant difference between the two groups of Ss offering substantive identity explanations ( $w = .30$ ,  $p > .05$ ). This was also true for perceptually oriented explanations and compensatory explanations (both  $w$ 's = .30,  $p > .05$ ). However, tribal Ss significantly differed from non-tribal Ss in not offering any explanation on this task ( $w = 1.28$ ,  $p < .05$ ).

*Overall Attainment of Conservation**I. Tribal Ss*

- (a) A tribal boy who was conserver of number, continuous length and discontinuous quantity of matter, did not conserve discontinuous length and continuous quantity of matter. He however, consistently used substantive identity to explain his reasoning on the conserved tasks.
- (b) Another boy who was conserver of continuous quantity advanced substantive identity explanation. He was a non-conserver of number and discontinuous tasks, while for the length tasks, he displayed transitional characteristics.
- (c) The third tribal subject was in a transitional stage of number and discontinuous quantity tasks, non-consumer of continuous length and quantity, and also for discontinuous length.
- (d) The fourth subject was a non-consumer of number, continuous and

discontinuous quantities. He also displayed transitional characteristics for continuous and discontinuous lengths.

- (e) The fifth subject was a non-consumer of number, continuous and discontinuous length and continuous quantity. He displayed transitional characteristics in discontinuous quantity of matter.

## II. Non-tribal Ss

- (a) A non-tribal boy, who was a conserver for number, continuous and discontinuous quantities gave compensation explanations for both of them to justify his arguments. He was non-consumer on the length task.
- (b) Another non-tribal subject was conserver of number, continuous and discontinuous lengths, and discontinuous quantity of matter. On the tasks of number and discontinuous length, he offered compensation arguments to explain his judgement of transformed stimuli, while for the discontinuous length and quantity tasks he offered reversibility and substantive identity arguments. This subject was also a non-conserver of continuous quantity of matter.
- (c) The third and fourth non-tribal Ss were non-conservers of all the five tasks, i.e., number, continuous and discontinuous lengths and continuous and discontinuous quantities of matter. In terms of developmental level, these subjects ranked lowest among all the participants of this study.
- (d) The fifth subject was a non-conserver of continuous length only. He consistently used substantive identity to explain his choices of conservation of number, discontinuous length and quantity along with continuous quantity. His response on the task of continuous length was limited to transitional stage only.

No significant difference exists between the tribal and non-tribal boys as regards the following. This was because all the *W*'s were insignificant at an alpha of .05 level of confidence.

<i>All the Five Tasks</i>	<i>Percentage</i>		<i>W</i>	<i>P</i>
	<i>Tribal</i>	<i>Non-Tribal</i>		
(a) Perceptual explanation	28	16	.19	NS
(b) Substantive identity explanation	16	20	.09	NS
(c) Compensation explanation	8	20	.28	NS
(d) Reversibility explanation	0	4	.20	NS
(e) Explanation not given	48	16	.50	NS
(f) b, c and d taken together	24	44	.32	NS

Critical value of  $w = 0.84$  is needed for an alpha of .05 level of confidence.



Taking into consideration all the tasks, the range of the scores for the tribal and non-tribal Ss were from 6 to 11 and 5 to 14, respectively. Their means were 8.00 and 9.6, respectively. Hence, the non-tribal S had an edge over his peer by 1.6 scores.

Of the 50 possible explanation responses, 17 were perceptual and logical responses, while the remaining 16 were 'no answers'. Percentage-wise they were 33. Within the logical category of explanations, 50 per cent were 'substantive identity' and 50 per cent were reversibility by reciprocity and inversion. The fact that 50 per cent logical explanations advanced by these Bastar boys belonged to the category of 'reversibility'<sup>4</sup> showed that certainly this state of their mental functioning was on a higher scale as compared to the other Ss-children of urban and rural backgrounds, adolescents and school teachers (Pachuary 1975a, b; 1976a, b; 1978a, b; 1981; 1983; 1985a, b; 1986; 1991a, b). This empirical evidence, clearly dispels the myth of many, that the tribal and/or disadvantaged Ss are deficient in intellectual abilities. On the contrary current evidences show that they are not. In fact the boys of Bastar have shown an edge over their peers residing in much more interactive/stimulating living and learning environments, especially in qualitatively negotiating the various Piagetian conservation tasks. Evidence shows similarity in information processing strategies needed to solve conservation problems by the tribal/disadvantaged boys.

## Discussion

Tribal Ss' conservation hasn't gone beyond 20 per cent on any of the five tasks for the sample age range of 9 to 12 years. This percentage has gone up to 60 in the case of non-tribals. None of the subjects of either category was a conserver for all the five tasks. Applying Piagetian (1964) criterion, none of the Ss of either category reached the 75 per cent level on any of the administered conservation tasks. If Laurendeau and Pinard (1962) criterion of 60 per cent is accepted, then, non-tribal Ss would attain conservation of number and discontinuous quantity. Gond boys of Betul district (Pachuary, 1993a) lagged far behind the Bastar halba boys of these five conservation tasks. The Bastar boys faced better opportunities to interact with others, both in the school and in the community. The Betul boys were living in almost isolated hutments, at least 7 kilometres away from the main road. They not only had a poor physique but also were poorly clad when compared to their Bastar cousins. Thus, in the absence of the non-interactive learning environment, poor health and home conditions, the Betul village boys (and girls) were forced to live in deprived conditions. Besides this, opportunities of making internal representations were also not available to them. Cognitive passivity was thus culture-bound in their case. Their life-

style by and large is tagged to maintenance level only and to a very large extent their perception and mental action remain undifferentiated, "thus their symbolic representation to extend time and space remain away from the immediate reality"

To bring about these changes, there are intermediary structures which Piaget call groupings which begin to develop at the end of the Sensori-Motor period, at about two years. These 'groupings' enable thought to free itself from perceptual control and to be established on a new plane where it is logical and operational and where systems of classes and relations are established (Oconnel, 1973).

In the absence of concrete referents, the logico-arithmetical groupings, i.e. classification, seriation and number together with those of spatio-temporal groupings (relations of proximity, separation, order, enclosure, continuity and spatial relationship and their measurement, coordination of different viewpoints, and horizontality and verticality) show severe developmental lag not only in normal Indian subjects but also in tribal and other disadvantaged Ss (Pachuary, 1989; 1991a, b; 1992; 1993a, b, c). Neither of these two arguments can be applied by these Ss to purely verbal reasoning. Piaget (1953) observed

It is a great mistake to suppose that a child acquires the notion of number and other mathematical concepts just from teaching. On the contrary to reasonable degree, he develops them himself, independently and spontaneously. Children must grasp the principle of conservation of quantity before they can develop the concept of number.

Inhelder (1963) also concurs with Piaget's (1953) observation.

The unique and pervading importance of the conservation or invariance concept is that the most elementary forms of reasoning, whether logical, arithmetic, geometric, or physical 'rest on the' principle of invariance of quantities.

Conservation is essentially a developmental process and it develops slowly in children. Therefore, Piaget contends that conservation is a necessary condition for all rationality. "It is imperative that teachers and curriculum writers understand children's development and such theories as conservation" (Rosenbloom, 1967).

### **Educational Implications**

According to Piaget (1964) knowledge is not a photocopy of reality. "To think is to perform operation in the sense of mental processes" (Vinh-Bang, 1972). Therefore, an operation is the essence of knowledge. It is an interiorized

TABLE 1

## Conservation Responses Made by Bastar Boys

		Tasks			
Group	Number	Cont-Length	Dis-Length	Cont-Qu	Dis-Qu
Tribal Ss	1	C	NC	NC	C
		SI	P	P	SI
	2	NC	T	C	NC
		P	Comp	SI	P
	3	T	NC	NC	T
		-	-	P	-
	4	NC	T	NC	NC
		P	-	-	-
	5	NC	NC	NC	T
		-	P	-	-
Non-tribal Ss	1	C	NC	C	C
		Comp	P	Comp	Comp
	2	C	C	NC	C
		Comp	R	-	SI
	3	NC	NC	NC	NC
		P	P	P	P
	4	NC	NC	NC	NC
		P	-	P	P
	5	C	C	C	C
		SI	SI	SI	SI

C= conserver  
T= transitional  
NC= non-conserver  
SI = substantive identity

Comp= compensation  
R= reversibility  
P= perceptual  
- = no explanation given

action that modifies the object. Constructivistic approach to teaching means creating situations where the structures can be discovered by the children. It does not mean transmitting structures to them. The pupils' role is not of 'hearing-about' verbal information. The process of abstraction and generalization is essentially a mental one, the task of the teachers is to order the learning environment so that the children can grasp relationships more readily to form concepts with greater facility and much confidence. In case, we really want to be honest in our dealings with the disadvantaged children, a curriculum theory based on the following seems necessary:

- (a) A base-line data be first created regarding the level of cognitive negotiability of a target disadvantaged population,

- (b) Substantive and syntactical domains of a discipline be matched to the level of cognitive negotiability of the target disadvantaged population;
- (c) Hands-on experiences should form the basis of concept development;
- (d) Pupil assessment be done on the basis of diagnostic remedial approach; and
- (e) Enrichment activities be designed on the basis of the diagnostic remedial approach.

This curriculum approach would meet the requirements of 'humanistic education' and therefore, chances of the disadvantaged Ss to succeed in these course-structures would be higher by the way of improving their intrinsic motivations and self-efficacy.<sup>5</sup>

#### NOTES

- 1 Conservation depends on the subject's ability to utilize mental images or conceptual representations to adopt a particular strategy in search of a solution of a problem.
2. Omega statistic see Downie and Heath (1965).
3. It is argued by Halford and Boulton-Lewis (1992) that "human beings have a limited capacity to see correspondence between structures, but have a much greater capacity to learn. It is suggested that this explains many cognitive developmental anomalies, such as the ability to perform a task in one context but not in another".
- 4 An Abujhmari-boy studying in Narayanpur, Bastar also advanced a reversibility logic. It is an uncommon response (Author's unpublished data).
5. Self-efficacy. Feeling that one can successfully achieve a particular outcome (Biehler and Snowman, 1990).
- 6 The Halba of Bastar. Bastar occupies the largest area of land (39,144 sqkms) among the districts of Madhya Pradesh (4,43,446 sqkms). Much of the Bastar has a hilly terrain. Beyond Kanker, the Keskai hills and its ranges have plateau between 2,000 and 3,000 feet. Forest occupies 70 per cent of the district's area. The important river of the district is Indravati. It flows across the district from east to west dividing it into two portions. Soil of Bastar block is red and sandy. It is suitable for the cultivation of the paddy. The Gonds are the descendants of the Dravidian race. Along with the Kols, they were the two original tribes who inhabited the State. The skin of these tribes was black and they were of short stature. On the basis of the totems, the Gonds have about a dozen sub-tribes now inhabiting the district of Bastar (Amanullah, 1987, p 5). With the passage of time, the Halbas have acquired the status of an independent tribe (Karpan Deshna 77.75 and Nasik Deshna 79.88 — Tiwan and Sharma, 1994, p.76). The Halbas inhabiting the Bastar block call themselves 'Nayak' (Dube and Bahadur, 1967, p.58). The village from which the sample of the Ss was drawn is therefore called 'Nayeekguda'. The Halbas are good cultivators. Economically they are better than the other tribes of the district and take interest in the education of their children. During the lean months of the year, the adults prefer to work as labourers near about their villages.

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# **Growing up in the Villages of Uttar Pradesh, India: The Parent As A Teacher (PAAT) Profile of Village Backward Communities**

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## **Abstract**

*During 1991-92, Project Learning Communities 1 (PLC1) set up Father, Mother, Teacher Organizations (FMTOs) in fourteen randomly selected government rural primary schools in Uttar Pradesh to determine whether 'FMTOs with a curriculum' could reduce student attrition. As a part of PLC1, The Parent As A Teacher (PAAT) Inventory was administered in the regional language (Hindi) by personal interview to 389 randomly selected school fathers and mothers the day after the first FMTO meeting. The sample parents belong to the backward communities of the village, and 90 per cent of the sample were illiterate.*

*The PAAT profile provides measures of parental attitude towards Creativity, Frustration, Control, Play and Teaching and Learning in their interactions with their children. The profile, based on item and subset mean, is used to identify fair parental attitudes and deficient parental attitudes that deserve consideration in building a new curriculum for the parents. The future programme for parents should integrate aspects of Uttar Pradesh village community life that are in accord with research on child development as in the PAAT profile, and should examine and attempt to remedy those aspects of village life that hinder*

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*the delivery of primary education to Uttar Pradesh village backward community children. ANOVA tests reveal gender-based difference in PAAT1 (pre) in favour of mothers at significance level 0.10; pre/post mean difference in creativity for fathers and mothers at significance level .05, and in PAAT for fathers at level .05, with PLC1 intervention.*

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This study examines the child-rearing abilities of village parents of the backward communities in the State of Uttar Pradesh, India. Most backward community children are enrolled in government rural primary schools from age 5 to 9 or 10. Over 50 per cent of these children drop out between Class I and Class V. Poverty and parental illiteracy are identified as the main reasons why children leave the village school (Patil, B.R. 1984). Neither cause can be easily remedied in the short term.

There are sixty-three districts in Uttar Pradesh. In 1991-92 an intervention programme entitled 'Project Learning Communities 1' (PLC1) was set up in two schools, in each of the seven randomly selected districts: Gorakhpur, Mirzapur, Bahraich, Jhansi, Bareilly, Saharanpur and Tehri. The aim of PLC1 was to examine if it is possible to form and maintain a 'Father, Mother, Teacher Organization' (FMTO) at the village school, and whether the 'FMTO with a curriculum' could curtail the attrition rate.

PLC1 intervention consisted of eight, three-hour meetings of primary school fathers, mothers, and teachers, generally in the evenings from 4-7 pm at the village primary school. Each meeting was based on a lesson plan. The lesson plans incorporated adult and non-formal educational approaches in a 'people-to-people' setting and constituted a curriculum to address a basic parental question: "Why does my child drop out from school and what can I do, placed as I am, poor, illiterate and at the bottom of the village hierarchy, to keep him/her there?" The meetings were conducted by PLC1 coordinators who were selected at the tehsil level and trained in the PLC1 curriculum by the author. The coordinators were paid; parents and teachers were not paid.

PLC1 could not be completely implemented in the districts of Bareilly Saharanpur and in one school of Jhansi. PLC1 was completely implemented in the other nine schools. The results of PLC1 constitute another paper and are not reported here.

As a part of PLC1, The Parent As A Teacher (PAAT) Inventory (Strom, R., 1984) was administered in the regional language by personal interview to 389 randomly selected fathers and mothers of children in the 14 sample schools the day after the first FMTO meeting was held at the school. In 1991-92, the PAAT profile of Uttar Pradesh village backward community parents was not

available in India; when available, the PAAT profile can be utilized to construct a more appropriate and *new* FMTO curriculum (PLC2), to modify the parent-child interaction of the said population. Such a modification may contribute to enhanced primary school student retention. Hence data were collected during PLC1 to construct the Uttar Pradesh PAAT profile described in this paper.

## **Method**

### *Sample*

One district was chosen at random from the seven administrative divisions (1991) of Uttar Pradesh; the sample districts were Gorakhpur, Mirzapur, Bahraich, Jhansi, Bareilly, Saharanpur and Tehri. One tehsil was chosen at random from each of the districts; the sample tehsils were Gola, Lalganj, Mahsi, Chirgaon, Faridpur, Bellakedi, and Chamba, respectively. Two primary schools were chosen at random in each of the tehsils. A roster of parents attending the first FMTO meeting at each school was compiled at the end of the meeting. A random sample of parents from each of the classes 1 through 5 and each of the major mohallas represented in the school population was chosen from the roster. Approximately 14 fathers and 14 mothers from each school are represented in the sample. The total number of sample fathers is 197, the total number of mothers is 192, with  $N=389$ , constituting a statistical sample of Uttar Pradesh village backward community primary school parents.

### *Tools*

In order to assess parental attitudes about rearing children, each subject was administered the Parent As A Teacher (PAAT) protocol (Strom, R., 1984). The inventory has been translated into 15 languages since its commercial production. For the present study, the translation into Hindi was undertaken by a translator in the Hindi cell of the Government of India, New Delhi, and reverse translated by a person well versed in Hindi, arriving at a consensus in translation. The PAAT inventory consists of fifty Likert-type interview items. These items reveal what parents expect of their primary grade child, how parents interact with their child, and the actions parents say they take in response to particular child behaviour. The fifty items consist of five subsets of ten items each, distributed through out the protocol. The five subsets relate to separate dimensions of parenting, namely, Creativity, Frustration, Control, Play and Teaching and Learning.



### *Procedure*

The PAAT protocol was administered by personal interview. The respondent was advised that there is no 'correct' response to any question and the choices are Strong Yes, Yes, No, Strong No, based on the strength of the response feeling elicited by the question. The interviewers were trained in a workshop. The interviewers consisted of PLC1 coordinators and teachers of the school. Fathers were interviewed by male interviewers, and 90 per cent of the mothers by females. Interviewers were fluent in the local dialect and were paid a fee for each completed interview. The author was the field coordinator.

### *Scoring*

The inventory calls for assigning a numerical value of 1, 2, 3, or 4 to each of the Likert-type items. The most desired response based on child development research is assigned the value 4, with diminishing values of 3, 2, and 1 assigned to the other responses based on their distance from the most desired. Thus, 27 items are assigned values (Strong Yes-1, Yes-2, No-3, Strong No-4), and 23 items elicit values (Strong Yes-4, Yes-3, No-2, Strong No-1) after values are assigned to each response, the subset totals provide a score for each subject. The total score is obtained by summing all five subsets. The mean for each item is 2.5; for each subset the mean is 25; and for the total score the mean is  $5 \times 25 = 125$ .

### **Results**

The creativity subset shows the extent to which parents are able to nurture the need of children to pretend and engage in imaginative functioning. The frustration subset seeks to identify the extent to which parents are disappointed due to their expectations being inconsistent with the developmental needs of the child. The control subset outlines the feelings that express the level of child control that parents believe they should exercise. The play subset discloses the extent of parental understanding of the influence of play on the growth of children. The teaching and learning subset reveals the self-impression of parents of their ability to facilitate intellectual development in the child.

Cross-cultural studies of families with three to nine-year-old children, have found PAAT to be a useful tool to identify parental strengths and needs (Strom, R., et al 1984; Strom, R. *et al.*, 1986).

Table 1 shows that the Uttar Pradesh rural backward community parents (N=389) recorded above average (M=25.0) scores in Play (M=26.49, SD=3.56) and teaching and learning (M=25.57, SD=3.49), and below average scores in

Creativity ( $M=24.60$ ,  $SD=3.15$ ), frustration ( $M=22.62$ ,  $SD=3.77$ ), and control ( $M=19.78$ ,  $SD=3.92$ ). The total score of ( $M=119.07$ ,  $SD=10.21$ ), is below the absolute mean of 125. In comparison, for backward community parents ( $N=225$ ) in the villages of Karnataka (R. Achuthan, 1993), the total score is ( $M=120.11$ ,  $SD=9.40$ ), and for middle class and lower class parents ( $N=179$ ) in the provinces of Gharbya and Kafer El-Sheikh of northern Egypt (Strom, R., *et al.*, 1991), the score is ( $M=114.16$ ,  $SD=10.87$ ).

TABLE 1  
PAAT Subset Mean Score for Uttar Pradesh Village Parents

<i>Subset</i>	<i>Mean</i>	<i>SD</i>
Creativity	24.60	3.15
Frustration	22.62	3.77
Control	19.78	3.92
Play	26.49	3.56
Teaching and Learning	25.57	3.49
Total	119.07	10.21

Absolute Subset Mean = 25.00; Absolute Total Mean = 125.00

Following (Strom, R. *et al* 1991), the profiling method used here groups responses by subsets, restating all items of the PAAT protocol in an abbreviated and positive form for uniformity of interpretation. The scores are presented from a low of one to a high of four depending on the degree to which the statement is supportive of desirable parent-child interaction. Items scores above 2.5 are interpreted as indicative of favourable attitudes and perception. Scores between 2.5 and 3.0 are categorized as slightly favourable, and scores above 3.0 as highly favourable. Item group means are plotted on continuum (Fig 1 - Fig. 5).

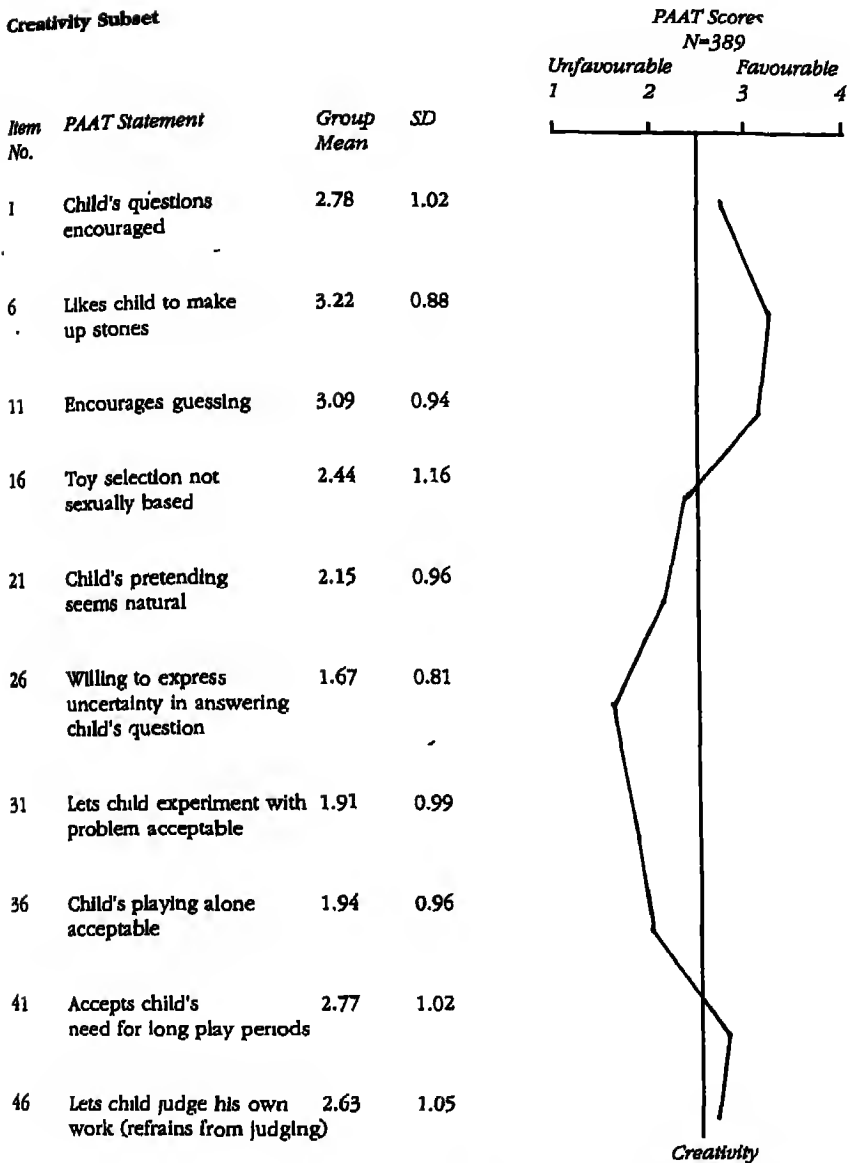
## Analysis

### *Creativity*

This realm of assessment concerns parental behaviour in nurturing creativity in their child. Fig. 1 reveals that two items had highly favourable scores ( $>3.0$ ), three items had slightly favourable scores (2.5-3.0) and the remaining five items had less than favourable scores ( $<2.5$ ).

# GROWING UP IN THE VILLAGES OF UTTAR PRADESH

## Creativity Subtest



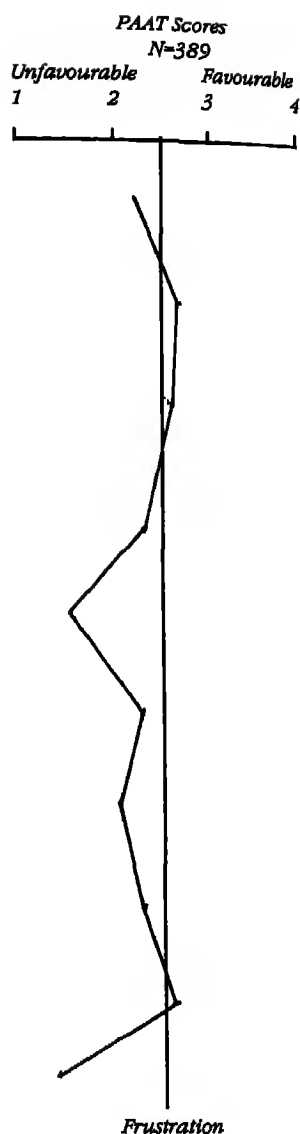
Scores 1.0 to 2.5 are classified as 'not so favourable'; 2.5 to 3.0 as 'slightly favourable'; above 3.0 as 'highly favourable'.

**Fig. 1** Profile of Creativity Analysis for Uttar Pradesh Rural Parents

# GROWING UP IN THE VILLAGES OF UTTAR PRADESH

## Frustration Subset

Item No.	PAAT Statement	Group Mean	SD
2	Noise permitted during child's play	2.36	1.04
7	Responds favourably to child's call to observe play	2.62	1.07
12	Child allowed free expression of fears and anxieties	2.60	1.09
17	Child questions accepted even when parent is busy	2.43	1.06
22	Fighting at play handled without punishment	1.71	0.80
27	Child may get dirty at play	2.36	1.14
32	Child may interrupt dyadic play	2.11	0.95
37	Child can play with as many toys as he pleases	2.40	1.04
42	Pays attention to child's showing off	2.54	1.03
47	Respects child's play as work in progress	1.48	0.78

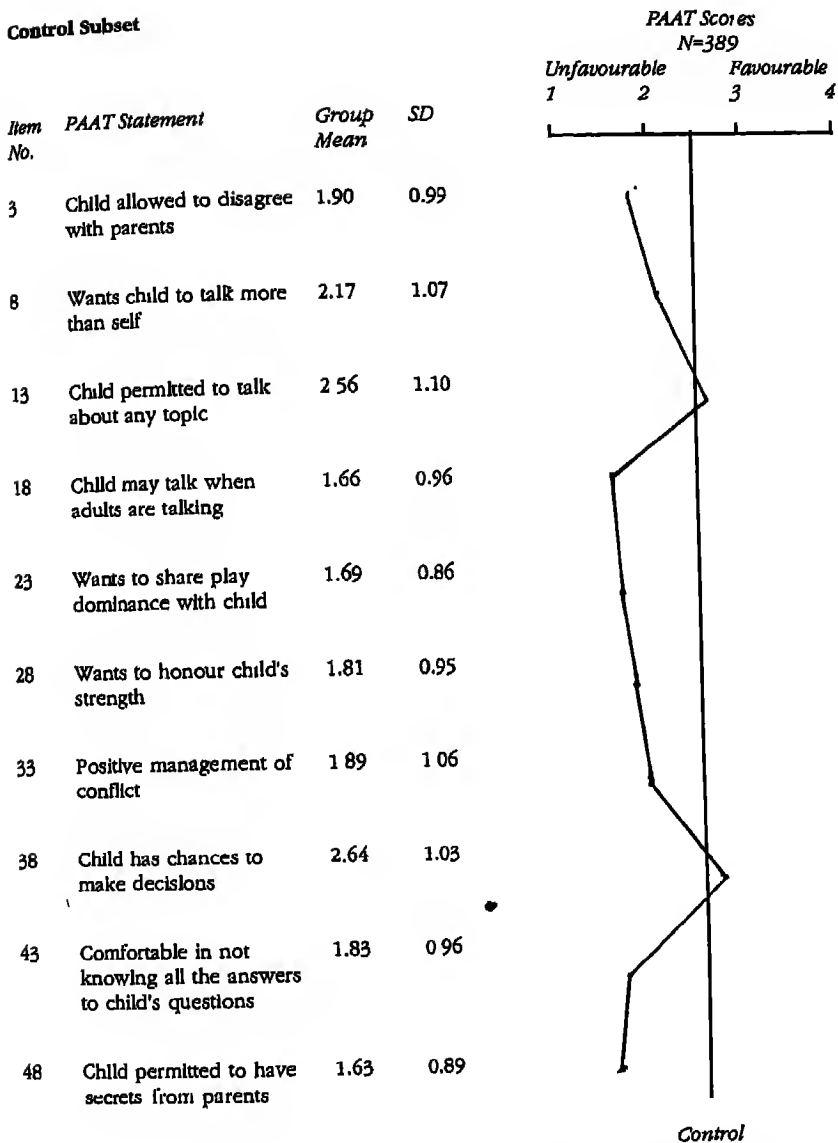


Scores 1.0 to 2.5 are classified as 'not so favourable'; 2.5 to 3.0 as 'slightly favourable'; above 3.0 as 'highly favourable'.

Fig. 2 Profile of Frustration Analysis for Uttar Pradesh Rural Parents

# GROWING UP IN THE VILLAGES OF UTTAR PRADESH

## Control Subset

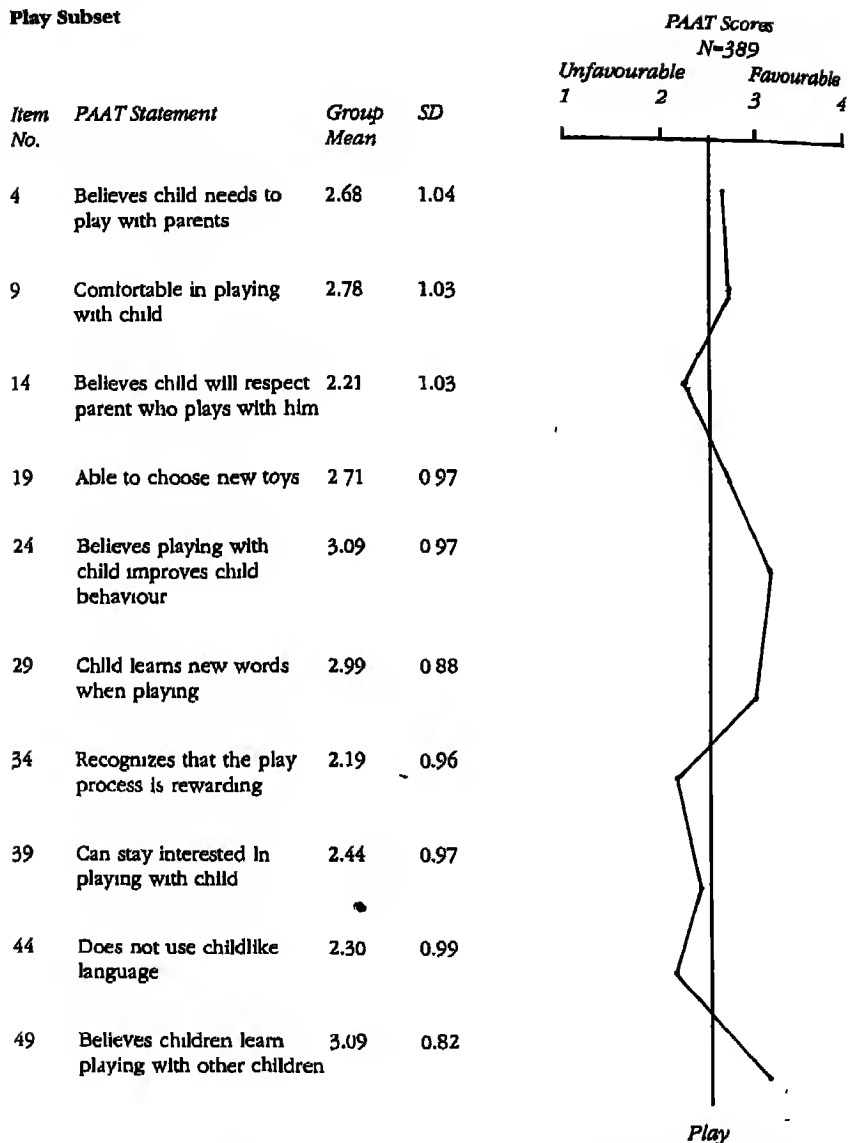


Scores 1.0 to 2.5 are classified as 'not so favourable'; 2.5 to 3.0 as 'slightly favourable'; above 3.0 as 'highly favourable'.

**Fig. 3** Profile of Control Analysis for Uttar Pradesh Rural Parents

# GROWING UP IN THE VILLAGES OF UTTAR PRADESH

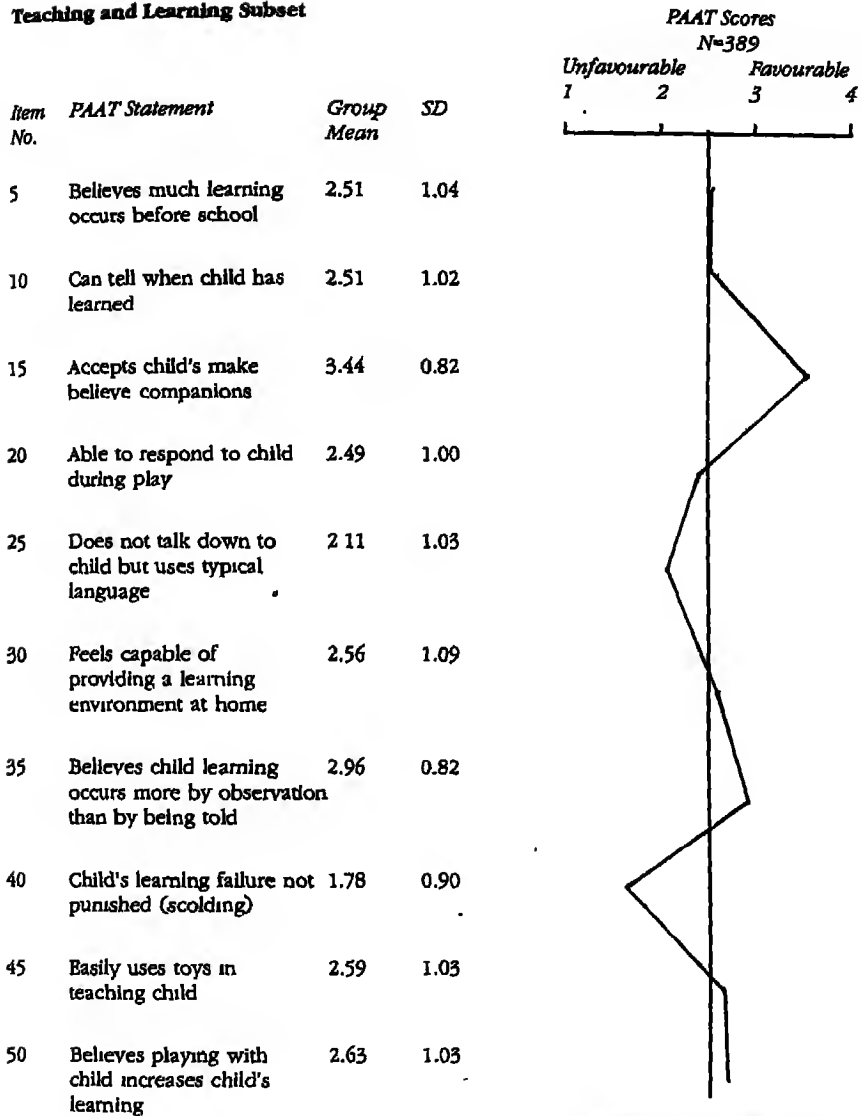
## Play Subset



Scores 1.0 to 2.5 are classified as 'not so favourable'; 2.5 to 3.0 as 'slightly favourable'; above 3.0 as 'highly favourable'

**Fig. 4** Profile of Play Analysis for Uttar Pradesh Rural Parents

**Teaching and Learning Subset**



*Teaching and Learning*

Scores 1.0 to 2.5 are classified as 'not so favourable'; 2.5 to 3.0 as 'slightly favourable'; above 3.0 as 'highly favourable'.

**Fig. 5** Profile of Teaching and Learning Analysis for Uttar Pradesh Rural Parents

Parents are supportive when sons and daughters make up stories and they encourage them to guess solutions to problem situations

Parents encourage children to ask questions. They have slightly favourable attitudes to allowing boys and girls to judge their own work. Parents also acknowledge children's need to play for long time periods.

The participants express unfavourable attitudes about allowing sons and daughters to select their own toys and in their anxiety when children engage in pretending. They express unfavourable attitudes about admitting ignorance on an issue; in their anxiety level when children experiment with solutions, and in their reservations about children playing by themselves.

### *Frustration*

This set of items emphasizes child rearing demands that could annoy parents and/or cause them to be intolerant. Fig. 2 reveals that the score on no item is highly favourable, that scores on three items are slightly favourable, and on seven items are unfavourable.

According to Fig. 2, members of the sample were able to withstand some frustration: parents respond slightly favourable when their children ask them to observe them at play and in their willingness to allow children to express their fears and anxieties. Parents are supportive of children's need for positive reinforcement in showing off their emerging abilities.

Uttar Pradesh parents show slightly unfavourable attitudes (Curranis, 1989) in their lack of tolerance for their children's question when they are at work and in limiting the number of toys that children may play with any given time. They have little tolerance for allowing children to get dirty while at play, to make noise while playing, or in interrupting their play to continue with the same later. Fighting at play is dealt with through punishment. The parents' lowest score is on the theory that children's play is children's work in progress.

### *Control*

Lessons of independence should begin early in life. As children grow, their experience should include varying situations in which they have a growing sense of personal control, instead of continuing domination by adults. It is at home, in the safe company of loved ones, that children should learn and practice control-taking skills in order to understand and ultimately take control of their own needs for interpersonal power (Alwin, 1988). Parents who understand the power needs of their children realize that sharing some control with them is desirable. The question to be resolved is whether this is possible only in a 'material resource-rich environment'.





Fig. 3 shows that there are no highly favourable scores, that scores on two items are slightly favourable and on the remaining eight are unfavourable.

There is a slightly favourable attitude towards allowing children to make decisions of their own and allowing children to talk on any topic.

Otherwise, parental attitudes are unfavourable: the parents want children to talk less than the parents and the children are not allowed to disagree with the parents; the parents are uncomfortable in not knowing the answers to all the questions the child may ask; conflict in play situations results in the play being terminated rather than the child being allowed to resolve the conflict, sons and daughters holding secrets from their parents is frowned upon; parents have a strong desire to maintain their dominance even during parent-child play; parents have limited ability to applaud children's strengths openly and children are inhibited from talking when adults are conversing. There is heavy emphasis on control among Uttar Pradesh rural backward community parents, often to the detriment of development of children's independence.

### *Play*

This area of assessment reflects parental understanding of how play influences child development. Fig. 4 reveals highly favourable scores for two items, slightly favourable scores on four items and unfavourable scores on four items.

Parents approve of their children playing with other children and believe that family-oriented play improves children's speech and vocabulary while simultaneously exposing them to family values.

The parents believe that children learn new words by playing, and appreciate and respond to children's need to play with the parents; parents are also comfortable in playing with children and believe children are capable of choosing their own toys.

Parents have some difficulty in showing sustained interest in children's games and some fear that playing with children will result in the children not respecting the parents. The parents also have difficulty in using child-like language and in descending to the children's level of play.

Parents in poverty, mainly concerned with their efforts to get the next meal, seldom have time even to rest. During PLC1 meetings, many parents expressed dismay that they had so little time to be with their children.

### *Teaching and Learning*

Responses in this subset reveal the extent of parents' view of themselves as resources for nurture, and their perception of children's role as learners.

Fig. 5 reveals that the score on one item is highly favourable, on six items is slightly favourable and on the remaining three items is unfavourable. Parents are strongly supportive of the children's make-believe companions.

Parents recognize that children learn more by observation than by being told; they believe that playing with their children increases children's learning; they express slightly favourable attitudes in their ability to use toys in teaching their children; they hold the belief that much learning takes place at home prior to school; they feel that they can provide children with a learning environment and that they have the ability to know when children have learned something.

However, parents also believe that they are unable to respond to the child or to maintain a child-like environment during play, and worst at all, they believe that if they scold their children when children make mistakes, they will learn better.

### **Implications of the Uttar Pradesh PAAT Profile**

About 50 per cent of all children enrolled in Class I drop out by Class V. The communities most affected by the dropout problem are the backward communities of the villages. Poverty and parental illiteracy have been identified as the major reasons for child dropout. About one-half of the Indian population of 879 million (Census 1991) lives below the Indian poverty line. The Net Reproduction Rate (NRR) in the 1991 census is estimated at 1.9 per cent. Neither poverty nor parental illiteracy can be removed easily in the short term. Given this background, the question to be addressed is: In what ways can the Indian village youngsters of the backward communities be helped to obtain primary education of at least 5 years duration?

Table 2 provides the Uttar Pradesh Indices, Positive and Negative Religious Sanctions (PANRES), Preparedness to Help Independent of Wealth, Education or Social Standing (PHINWESS), (Achuthan, R., Leonhard, P., 1991a) Independence from Traditional Control (INTRCON) (Achuthan, R., Leonhard, P., 1991b), and the Uttar Pradesh giving Behaviour on money and service. (Achuthan, R., Leonhard, P. 1992).

PANRES is identified as the 'source' in Indian culture for 'helping non-familial others who are perceived to be in need of help, beyond taxes paid and temple donations/zakat made'.

Would one help all such others indiscriminately or would one be selective? PHINWESS is a positive measure of the selectivity, operational in helping behaviour.

Have the modernizing institutions of industrialization, urbanization, formal education, military service etc., resulted in the emergence of independence from traditional control in the Indian personality? INTRACON provides a measure of this development.

TABLE 2

Item	N	PANRES		PHINWESS		INTRACON		Giving Money		Service	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Age* 20-44 Yrs	158	9.0	1.9	3.5	3.5	4.6	4.1	6.9	10.0	15.1	13.5
House- hold Income* <Rs. 400	61	9.4	0.8	2.4	2.9	3.5	3.6	6.7	10.0	11.8	14.0
Formal Education* 0-5 Yrs	163	9.5	0.9	3.3	3.3	4.1	3.9	5.5	8.4	11.9	11.7
Rural Males	109	9.0	1.9	6.3	3.2	6.9	4.0	3.8	4.0	16.3	13.2
Rural Females	101	9.5	0.7	1.2	1.6	1.8	2.3	9.3	11.7	10.8	11.3
Hindu*	222	9.0	1.8	4.0	3.6	4.6	4.1	6.0	9.2	13.9	12.5
Muslim*	36	9.6	0.6	3.5	3.4	4.8	4.3	9.5	11.6	14.9	14.1
Total*	258	9.1	1.7	3.9	3.6	4.6	4.2	6.5	9.6	14.0	12.7

Range: PANRES, PHINWESS, and INTRACON: Min-0; Max-10; Neutral-5

Range: GIVING Money-0 to 44 days of Earnings per year.

GIVING Service-0 to 44 days of time per year; 1 day=8 hrs.

Data Date: 1986-87; \*: Represents total state data.

From Table 2, the Uttar Pradesh general population experiences strong PANRES ( $M=9.1$ ,  $SD=1.7$ ), a below neutral measure on PHINWESS ( $M=3.9$ ,  $SD=3.6$ ), and is currently somewhat tradition bound, INTRACON ( $M=4.6$ ,  $SD=4.2$ ). On an average they donate to others 6.5 days of earnings per year and provide 14 work-days of voluntary service per year.

The yet to be created curriculum that would enhance the PAAT profile of the village backward communities must incorporate the above strengths and cultural resources in relation to giving and helping of the Uttar Pradesh general population as identified in Table 2. Design of this curriculum will require a separate paper.

Table 3 presents the findings of ANOVA tests.

During the school year 1991-92, Project Learning Communities conducted eight meetings of the sample school FMTOs approximately two weeks apart, each of approximately three hours' duration. The FMTOs had a curriculum (PLC1) that was *not* based on the PAAT index, as the index was not available then. Data for the PAAT index were collected both pre (1) and

post (2) PLC1 intervention. The pre-sample from 14 schools consisted of 197 fathers and 192 mothers. The post-sample from the 9 schools that completed PLC1 consisted of 88 fathers and 95 mothers.

53 fathers and 53 mothers were common to both samples, enabling paired, pre/post, test.

Six paired test on pre (1)/post (2) scores, on the indices CTY, FTN, CTL, PLY, TLG and PAAT for Uttar Pradesh Fathers (N=53) and Mothers (N=53) were conducted. The results identified significance on CTY for fathers and mothers at the .05 level, and for fathers on the PAAT at the .05 level. These results indicate that even the non-PAAT, FMTO curriculum utilized in PLC1 of 91-92 was of some constructive value.

TABLE 3

## Anova Tests

## 3.1

State: Uttar Pradesh

Fathers

Variable	Obs	Mean	SD
CTY1	53	23.71698	3.295553
CTY2	53	25.03774	2.54167
diff	53	-1.320755	3.931009

Ho: diff = 0 (paired data)  $t = -2.45$  with 52 d.f.  $Pr > |t| = 0.0179$

## 3.2

State: Uttar Pradesh

Fathers

Variable	Obs	Mean	SD
PAAT1	53	118.6604	8.29259
PAAT2	53	121.4151	7.49726
diff	53	-2.754717	9.494747

Ho: diff = 0 (paired data)  $t = -2.11$  with 52 d.f.  $Pr > |t| = 0.0395$

3.3

State: Uttar Pradesh

Mothers

Variable	Obs	Mean	SD
CTY1	53	25.43396	2.6567
CTY2	53	26.43396	2.7492
diff	53	-1	3.436232

Ho: diff = 0 (paired data)  $t = -2.12$  with 52 d.f.  $Pr > |t| = 0.0389$

3.4

State: Uttar Pradesh

PAAT 1

Variable	Obs	Mean	SD
Fathers	53	118.6604	8.29259
Mothers	53	121.9245	9.834885
Combined	106	120.2925	9.20038

Ho: mean (x) = mean (y) (assuming equal variances)  $t = -1.85$  with 104 d.f.  $Pr > |t| = 0.0676$

The ANOVA test on the PAAT score, PAAT 1 (pre-intervention), based on gender, affirms a difference in favour of mothers at the 0.10 significance level.

### Conclusion

The PAAT profile of Uttar Pradesh backward community village parents of young children suggests that they should be willing to accept certain types of behaviour of children conducive to their growth: become more approving in allowing children to sense personal control over their lives in ways practicable, experience less frustration in their relationships with their children and be more nurturing of creativity in their children — all while continuing to experience their current levels of poverty and illiteracy. At present, they are slightly positive about themselves as their children's main teachers and guides, and they do understand that play is children's way of learning and developing.

Using the item-mean score, a parent-curriculum for FMTOs can be build on these strengths, keeping in mind that these parents and children have to reach and jointly grasp school activity for the children, while all are living in penury.

Uttar Pradesh policy makers in Primary Education, Adult Education and Non-formal Education can come together to take the necessary decisions to

bring FMTOs with a PAAT-based curriculum into the primary education process by forming and maintaining FMTOs. The new FMTO curriculum must attempt to correct the deficiencies in the PAAT subindices, though many of these deficiencies may be due to the poverty and illiteracy of the parents. The FMTO with its new curriculum forming a *learning community*, could become the forum that integrates the parent with the school and the learning needs of the child. The children can thus have the opportunity to acquire text-based intelligence, essential for them and the nation, to compete in their relative spheres in the activities of the 21st century.

An expected natural return from primary education is a reduced Net Reproduction Rate (Colclough, C., 1980). Under reciprocal altruism, the State and Central Governments of India and the Indian middle-class should view this probable outcome as worthy of practical investment. These expectations should elicit constructive action for rural school 'FMTOs with a PAAT-based curriculum' from the people and the Government.

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# Western and Indian Perspectives on Intelligence: Some Reflections

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## Abstract

*This paper traces the contemporary theoretical developments in the West in conceptualizing intelligence and also explores the indigenous Indian views on intelligence. The notion of intelligence as reflected in the everyday life of the Indian people are also examined. After presenting a critical appraisal of issues, an agenda for future research in the field of intelligence and its assessment has been presented.*

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As a part of human assessment, intelligence testing occupies a central place in the theory and practice of the disciplines of psychology, education and human development. It has proved as one of the strongest claims of practical and applied psychology and has been used extensively in selection, training, evaluation, and diagnosis in clinical, industrial and educational settings. Variations in mental abilities and reasons for them have intrigued the students of these disciplines, particularly psychologists, the questions about intelligence abound and proliferate in theoretical and empirical literature. The most basic question of all such inquiries is: What is intelligence? Many believe that a notion of universally applicable concept of intelligence, as psychologists have used it for better part of the century, is dying or is already dead (Mercer, 1988). It is now best understood, as contextualists or relativists assert, in culture-relative terms. Against this background this paper traces the



theoretical developments in the field of intelligence in Western and Indian contexts and proposes an agenda for future research.

### **The Western Perspective on Intelligence: An Historical Overview**

A perusal of the *Great Books of the Western World* (1987) suggests that at least some concept of intelligence goes back to the ancient Greeks (Sternberg, 1990a). Beginning with Homer, the sixth century B.C. writer to John Locke, an empiricist philosopher of the seventeenth century, the dominant view of intelligence has been that there are different kinds or aspects of intelligence and that people differ in these respects. In general, intelligence was viewed as an important natural disposition. For example, Homer saw intelligence as 'an entity', Plato as the 'ability to learn', Aristotle as 'quick wit', Augustine as 'good qualities', Aquinas as 'universal and deeper understanding', Montaigne as 'ability to seek out knowledge and truth', Pascal as 'precise intellect and mathematical intellect', and Locke distinguished between wit and judgement. It was only Adam Smith, an economic philosopher of the nineteenth century, who traced an economic origin of the differences in talent. Immanuel Kant believed that intelligence comprises of three parts: *understanding, judgement and reason*. John Stuart Mill was particularly interested in one facet of intellect, i.e. originality. Finally, William James, both a philosopher and psychologist, remarked that humans and non-humans differ in their ability to associate ideas by similarity.

The work of Esquirol (1838), a Frenchman, on mental disorders is considered to be the beginning of the era of mental testing. However, the term *mental test* first appeared in the work of J.M. Cattell (1890) who put forward ten physical and mental measurements. The nineteenth century work on human inheritance by Darwin (1859, 1872) and Galton (1869), as well as Quetelet's (1842) applications of probability to the sphere of measurement are also notable landmarks in the history of human intelligence. In addition, another pre-Darwinian writer, Abercrombie (1839), foreshadowed more recent portrayals of the active, adaptive functions of 'intellectual power' or reason. Porter (1891) argued that to know is a pre-eminently active operation of the intellect, that in 'knowing, we are not so much recipients as actors' (p.61). It was argued that intelligence functioned so as to adapt a complex organism to complex environments; it acts as a 'selecting agency', an efficacious instrument of survival. From this perspective, attention came to be focussed on the *modus operandi* of the phenomenon (Angell, 1907) and on the process of intelligence, called cognition or intellection (Stout & Baldwin, 1901). Greater consideration was given to the practical operations of intelligence than to analysis and comparison of its content (Dixon, Kramer

& Baltes, 1985). Furthermore, this conceptualization of intelligence as an active form of 'consciousness' was combined with a 'genetic' (or developmental) approach (Angell, 1907; Baldwin, 1902) to psychological ontogenesis. Numerous recent writers have reasserted the significance of an active, functional, pragmatic depiction of mature intelligence (Baltes, Dittmann-Kohli & Dixon, 1984).

The most notable advances in the early twentieth century were made in the design and production of practical methods of assessment. This was done under the influence of natural science model as an ideal for doing psychology. So concrete objective reality had to be created. Development of intelligence tests proved to be a handy tool for this purpose. Binet and Simon (1911) developed practical means of identifying children academically at risk. Although Binet had devised a rudimentary form of scaling, it was Stern (1912) who proposed the enduring mental quotient as an indication of a person's overall mental caliber. Binet's more immediate legacy, however, was in his methods, which contributed to the growth of psychometric formulations and procedures, such as those of Spearman (1914, 1927). According to Guilford (1967), these psychometric procedures emphasized 'the need for a multiple-aptitude view of intelligence' (p.23).

The concept of mental age (MA), as proposed by Binet, for several reasons (such as equivocality, non-linearity, and unidimensionality), proved to be of a weak link in the psychometric analysis of intelligence. Intelligence quotient (IQ) has tended to be computed on the basis of relative performance within a given group (deviation IQ), as is done in Wechsler Adult Intelligence Scale (Wechsler, 1958) and Wechsler Intelligence Scale for Children (Wechsler, 1974).

In recent years different theoretical perspectives on intelligence have emerged. Sternberg (1990a) argues that various analyses of intelligence are often discussions of not one referent but of different things. Intelligence is a construct and not a representation of some physical object. Therefore, a theorist can choose facts to fit his or her view of intelligence or any other construct within a given set of disciplinary practices and modes of knowledge production. Sternberg (1990a) groups the theories of intelligence into broad classes, each based on what he calls a *metaphor* of the mind. A metaphor is a commitment to view a phenomenon as a specific case of a particular class of phenomenon representing the prevailing *world view*. Sternberg (1990a) groups the metaphors into classes and builds a taxonomy: classes of metaphors and specific theories within classes. The top branch of the taxonomy distinguishes between *inward looking* metaphors that focus on the mental capabilities of the individual without much concern for what this means for social interaction (e.g. *psychometric, computational, biological* and

*epistemological* theories) and the *outward looking* metaphors that view intelligence as a set of behaviours to be evaluated within the context of individual's society (e.g. *anthropological* and *sociological* theories). Finally, the *systems* metaphor looks both inward and outward. The major metaphors of mind include geographic, computational, biological, epistemological, anthropological, sociological and systems. A brief account of these metaphors and related theories seems to be in order.

The *geographic metaphor* views a theory of intelligence as a map of mind. This view extends back at least to Gall (Boring, 1950) who investigated the topography of the head, looking for the hills and valleys in each specific region of the head that would tell a person's pattern of abilities. Most of the early theories, such as Two Factor Theory (Spearman, 1927), the Theory of Bonds (Thompson, 1939), the Theory of Connections (Thorndike, Bregman, Cobb & Woodyard, 1926), the Theory of Primary Mental Abilities (Thurstone, 1938), Hierarchical Theories (Buret, 1949; Cattell, 1971; Vernon, 1971) and the Structure of Intellect Model (Guilford, 1967, 1982) implicitly or explicitly employ or subscribe to the geographic metaphor of intelligence. Recently Carroll (1993) has identified following cognitive domains : language, reasoning, memory and learning, visual perception, auditory reception, idea production, knowledge and achievement, psychomotor abilities, and personal characteristics such as cognitive styles. The geographic model has, however, become increasingly less popular in the second half of the twentieth century primarily for three reasons. First, it has little, if anything, to say about mental processes. Second, it proved to be extremely difficult to test factor-analytic models against each other. The factor structures of intelligence are often found to be complex and vary considerably across culture (Lorner, 1990). Third, the whole notion of trying to understand intelligence primarily on the basis of individual difference data appeared to be untenable and therefore came under severe attack.

The *computational metaphor* has probably been the predominant metaphor for studying intelligence during the past two decades. With this line of thinking researchers have sought to understand intelligence in terms of mode(s) of information processing that people deploy while they think intelligently. The Verbal Efficacy Theory of Hunt (1980) and Sternberg's (1977) Componential Theory aim at examining the information processing routines (programmes) underlying intelligent thought. More recently, Das (1992) and Das, Naglieri and Kirby (1994) have approached the nature of intelligence in terms of organisation of information processing activity of the brain. Their theory analyses cognition in terms of planning, attention, simultaneous and successive process (PASS). These theories have, however, not been without their problems. For example, it is just not clear how similar

computer programmes and human intelligence are. It also does not take into account of, or specify the differences in what people mean by intelligence in various parts of the world. Finally, computational metaphors are strictly molar. For the most part, they have not been directly related to the brain functioning.

The *biological metaphor* emphasizes on studying the brain and the operation of the central nervous system. The adherents of this view differ fairly widely in the approaches they take to studying intelligence. For instance, the neuropsychological approaches (Geschwind & Levitsky, 1968; Halstead, 1951; Hebb, 1949; Konorski, 1967; Luria, 1973, 1980; Springer & Deutsch, 1985) seek to understand intelligence in terms of the size and structure of brain. The electrophysiological and blood flow approaches seek to understand intelligence in terms of either electroencephalographic measurement (Eysenck & Barrett, 1985; Galin & Orenstein, 1972; McCarthy & Donchin, 1981) or in terms of the cerebral blood flow in different regions of the cerebrum (Horn, 1986; Risberg, Maximilian, & Prohovnik, 1977).

The *epistemological metaphor* draws heavily upon the philosophy of knowledge for its conceptualisation of intelligence. These theories tend to be developmental in the range of issues they consider. Prominent among these theories is Piaget's (1960, 1972) theory of genetic epistemology. Piaget viewed the function of intelligence to be adaptation, which includes assimilating the features of environment to one's own structures and accommodating one's cognitive structures to accommodate new features of environment. Though Piaget's theory is elegant; some aspects are untestable and others prove inadequate as descriptions of, and explanations for, children's development (Brown & Desforges, 1979; Siegel & Brainerd, 1978). In recent years Piagetians have started to recognise the importance of contextual factors in intellectual development (Denney, 1994).

The *antibiological metaphor* seeks culture-specific definitions of intelligence. It is based on the notion that "cultural factors prescribe what shall be learned and at what age. As a result different cultural environments lead to development of different patterns of ability" (Ferguson, 1954, p.121). Included within this metaphor are Berry's (1974; & Irvine, 1986) Radical Cultural Relativism, Cole and Means' (1981) Conditional Comparativism, and Charlesworth's (1979) Ethological Theory. The radical cultural relativism attempts to understand how different levels of context (e.g. ecological, experiential, performance, and experimental) shape intelligence. The conditional comparativism sees how different cultures have organised experience to deal with a single activity. The ethological approach focusses on intelligent behaviour as it occurs in everyday life rather than in test situations and how these situations may be related to developmental changes.

Recent developments in the assessment of intelligence have looked into everyday ideas (Goodnow, 1988) lay concepts or implicit theories (Sternberg, Conway, Ketron, & Bernstein, 1981) and parental belief systems (Sigel, 1985) concerning development of intelligence. Attempts have also been made to find out the indigenous definitions of intelligence. For instance, Ugandan villagers associate intelligence with adjectives such as slow, careful and active, whereas Ugandan teachers and Westernized groups associate intelligence within the word speed (Wober, 1972). The Ugandan view casts intelligence as both knowing how to do and doing the socially appropriate thing. While Americans stress on technical intelligence (Lutz & LeVine, 1982), some African groups emphasize both capability in specific situations and social responsibility, such as cooperativeness and obedience (Serpell, 1982). Kipsigis (Kenyan) parents interpret intelligence as including responsible participation in family and social life (Super & Harkness, 1983), Malay students regard intelligence as involving social and cognitive attributes (Gill & Keats, 1980). Thus cultural variation in value judgements endorse the view that performance in cognitive tasks is inseparable from values about appropriate social relationships in such situations.

The anthropological metaphor deals with the effects of enculturation. On the contrary, the *sociological metaphor* deals with the effects of socialisation. It is more concerned with the question of how socialisation within any culture affects the development of intelligence. Sociological theories view intelligence as the product of the social development of the individual. The prominent theories of this kind include Vygotsky's (1978) Theory of Internalisation, Feuerstein's (1980) Theory of Mediated Learning Experience, and Heath's (1983) Ethnographic Approach to Socialisation. Spurred by the theoretical contributions of Vygotsky, in recent years increasingly greater attention has been paid to the importance of social contexts for understanding the emergence of cognitive skills. "The context-centered approach", as Borkowski (1994) has noted, "is more warm-blooded", continually rooting cognitions in specific physical and social environments" (p.156). The concept of desituated cognition strongly implies that flexibility in thinking (the essential ingredient for transfer and generalisation) can only be achieved by transcending highly situated or context-bound procedural knowledge (Light & Butterworth, 1992)

Lastly, the *systems metaphor* is an attempt to bring together various other metaphors by viewing intelligence in terms of a complex interaction of various cognitive and other systems. For instance, Gardner's (1983, 1993) Theory of Multiple Intelligence is based on the assumption that intelligence is not a single entity, rather, there exist multiple intelligences, each distinct from others. Gardner proposed seven intelligences: linguistic, logical-

mathematical, spatial, musical, bodily-kinesthetic, interpersonal, and impersonal. The Triarchic Theory of Intelligence, developed by Sternberg (1985, 1988), consists of three interrelated sub-theories — componential, experiential, and contextual — that attempt to account for the bases and manifestations of intelligent thought. Ceci's (1990) bioecological theory of intelligence assumes that there exist multiple cognitive potentials and the role of context is critical in both the development and display of these potentials.

Recent advances in conceptualizing intelligence has adopted altogether a different perspective which has blurred the distinction between cognition and affect. Traditionally intelligence was treated as predominantly a cognitive affair with little or no concern for emotional and motivational components of behaviour. Now with growing interest in concepts like wisdom (Sternberg, 1990b) attention is being paid to many neglected aspects of intelligence. Wittrock (1991) has identified four areas — student perception, processes of learning and comprehension, metacognition and affective thought process (motivation and anxiety) that has contributed to refined concepts of intelligence and knowledge acquisition and use.

Thus, it is clear that the psychometric approach to intelligence is being questioned on various grounds. Intelligence is more and more being treated in processual terms and considered as grounded in the socio-cultural context within which it operates. Notwithstanding these conceptual developments the practice of traditional mode of intelligence testing is continuing.

### **The Indian Perspective on Intelligence**

All cultures have developed a variety of models of how mind works. Though, none of these models provide complete or universal picture of all aspects of mental processing, many of the models provide intuitive windows into particular aspects of problem solving. Reflecting on the models available in eastern civilizations, Goonatilake (1987) observes that major models from the South-Asian traditions, include (a) the different systems of logic described in the Buddhist and Jain traditions, (b) the various epistemologies, the different ways of perception and cognition described in several schools of Eastern philosophy, and (c) the different systems of linguistics from Panini to Bathruhari. These models are complex and involve philosophical questions and are not easily comprehensible within framework of pure empiricist approach of the mainstream psychology. The notion of knowledge, its purpose and ways of knowing in Indian tradition have been approached in the different schools of philosophy in diverse ways depending on the notion of reality. The related concepts are not easily translatable into the prevailing western categories. It would be premature and naive to make substantive

comparison of these with Western views at this juncture. Therefore, the present analysis will be confined to presenting an overview of selected Indian notions which are intelligence like. With this in mind this section briefly presents some of the Indian (Hindu) views on intelligence and its social representation in the tradition of ancient Indian thought.

#### (a) *The Concept of Pratibha*

In the Indian philosophical thought one way in which intelligence is conceptualised is in terms of *Pratibha* as noticed in *Nyaya Vaisesika* and *Prajna in Patanjali's yoga* system. The evolution of Indian thought supposedly owes its origin to the genius or *Pratibha* of the *Rishis* or seers who actually saw or realised the Truth or Reality; to whom time, space and other limitations being vanished, the *manas* stands face-to-face with the realities of all things (Mukhopadhyaya, 1966).

*Pratibha* literally means a flash of light, a revelation and is usually found in literature in the sense of wisdom characterized by immediacy and freshness. It denotes any kind of knowledge which is not sense-born nor of the nature of an inference. It might be called the supersensuous and suprarational appreciation, grasping Truth directly, and, therefore, seems to have the same value in Indian philosophy as intuition has in the Western systems (Kaviraj, 1966). According to Moore (1967), in almost all *Dharma-Sastras* and *Artha-Sastras*, the validity and necessity of intuition (and also wisdom) to supplement the rational and intellectual pursuit has been recognised. The *Stravana* (the testimony of the seer), *manana* (philosophical disquisition), and *nidhidhyanasana* (yogic meditation) are stepping stones to *anibhavana* (intuition) and *sakshatikara* (realisation) (Venkateswara, 1980).

In *Agamic* literature, the term *pratibha* stands for the Highest Divinity, understood as the principle of intelligence and conceived as female. The prime characteristic of this supersensuous knowledge is its immediacy and intense clarity. Such knowledge is considered transcendental, being held to be free from the time and space limitations. This knowledge is aptly described as simultaneously illuminating everything in every respect and as eternal.

The doctrine of *pratibha* also finds elaborate treatment in the *Tantrika* literature. It has been equated with the doctrine of *Vak*. *Vak* is the supreme power of *Parama Siva* — the Power, ever in association with Him, of His eternal self-contemplation and self-revelation. However, the doctrine of *pratibha* does not find a place in *Vedanta* and is opposed in *Mimamsa* (Purva) literature. In the Buddhist philosophical literature, the term *pratibha* is not generally found. But the word *prajna* is most frequent and has been used

in the sense as is found in *Patanjali's* system. In the Jainism, however, *pratiibha* has been used the way it has been treated in the Hindu literature.

The *Samkhya* philosophy characterizes *Prakriti* (*Pra*=excellent, *kriti*=creation) as consisting of three *gunas*(constituents) : *Sattva*(lightness), *Rajas*(passion), and *Tamas*(heaviness). Of the three, *Sattva* is considered as an essence of luminous intelligence, with the tendency for manifestation or reflection, but without mass or gravity and, therefore, unable to manifest. *Tamas* has the ingredients of manifestation, such as matter, mass, gravity, volume and density, but with inertia which makes any independent movement impossible. The *rajas*, characterized as moving principle, has the energy that could counteract and dispense the inertia of *tamas* (Jayakar, 1988). *Prakriti* remains in an unmanifested state until it is enlivened by *purusa* (consciousness). The first manifestation or *prakriti* to arise from her association with *purusa* is *buddhi* (intellect).

The *Samkhya* sees intelligence in terms of eight *bhavas* (meaning "state of being"). The *bhavas* are of two types — *sattvika* and *tamasika*. *Dharma* (virtue), *jnana* (knowledge), *vairaga* (non attachment), and *aisvarya* (power) constitute the *sattvika* (pure) *bhavas*; *adharma* (nonvirtue), *ajnana* (ignorance), *raga* (attachment), and *anaisvarya* (weakness) constitute *tamasika* (impure) *bhavas*. Action in accordance with either *bhava* yields a predictable result. To get out of *tamasika bhavas*, active pursuit of knowledge is required.

The concept of intelligence was not only given importance in the literature but also occupied a significant place in everyday life and its practice. This is evident from the fact that immediately after birth there follows a number of ceremonies in quick succession, such as *ayusya* for longevity, followed by *medhajanana* to produce intelligence, etc. As Ghosh (1942) has noted, *ayusya* and *medhajanana* take place even before the naval string is cut-off. It may be mentioned that during the ceremony of *medhajanana*, the goddess of intelligence, Saraswati, is worshipped.

#### (b) Social representation of Intelligence: Images in Ancient Indian Thought

After analysing 178 ancient Sanskrit texts, Shastri (1985) in his *Sanskrit Sukti Ratnakar* has collected 2710 *suktis* or *subhastias* (good words) on 545 subjects. These *suktis* are more than mere being *slokas* or good words. They may be small but are believed to be more serious, miraculous, close to ultimate reality, and reflect long experiences of foresighted saints. As a small lamp lightens the entire house, these *suktis*, many of which are only one or two steps of a *sloka*, reveal the secret of the living and non-living world. They often provide guidelines for human life. Shastri's (1985) list includes a number of concepts/themes related to the notion of intelligence. These topics



have been used albeit interchangeably in the literature. The following analysis is based on the suktis listed on topics such as *Buddhi*, *Prajna*, *Jnana*, *Daksha*, *Vivek*, *Vidya*, and their antonyms..

*Buddhi* is considered to be the best and pious entity which humans possess. One could achieve *buddhi* through one's *skarma* or deeds (actions). Intelligence is also considered to be a gift of God. The image of an intelligent person is depicted as follows: An intelligent person is capable of knowing the intention of others, polite and away from self-praise, has initiative, has interest in work, persistence, motivation and reasoning. He lacks rigidity. His keen observations are sharp enough to decipher even the intentions of animals and birds. An intelligent person becomes alert even before an emergency arises and is not disturbed by difficult situations. He is always ready to fight for the right cause. This representation characterizes practical understanding situated in real life regarding self, others, objects and the total habitat of a person.

Like western notions of intelligence, the ancient Indian view distinguished *praitbhaas* lower and higher, bad and good. Thus good intelligence leads to happiness, pleasure, prosperity and is constructive whereas bad intelligence is destructive and leads to unhappiness in life. Intelligent persons are equated with adults, whereas people with low intelligence (*ajnanis*) are considered like children. An intelligent individual is supposed to enjoy super powers. He is able to distinguish between right and wrong. In a situation of losing everything, intelligent persons let the half lose for the benefit of the remaining half. To have an intelligent enemy is thought to be better than having a foolish friend.

Intelligence is considered essential for obtaining *Vidya* (knowledge). To this end the importance of practice has been emphasized. *Vivek*, also known as experiential intelligence, is thought to be the biggest asset in the three worlds which could lead to happiness and prosperity. It is derived from perceptual analysis, inference, analogical reasoning and materials learned from books and authorities (Das, 1994). The importance of *Guru* in realizing *Jnana* is emphasised. Egoism is thought to be the greatest enemy of an intelligent individual. Desire, passion and biases constrain intelligence. Inadequate temperament orient an individual to the darkness of ignorance. Sloth and impulsivity, orientation for action characterised by a desire for knowledge fuelled by its immediate utility, pride, assertiveness, etc. are considered as barriers to intellectual development. One has to rise above the influence of desire, of unfavourable temperament through right ideas, effort and reflection for gathering valid and appropriate knowledge.

The above discussion, to some extent, illustrates the richness and importance of the notion of intelligence and intelligent people in the

traditional Indian thought. It is, however, sad to note that these indigenous views have received little or no attention in the academic discourse in psychology in contemporary India.

### Discussion

A perusal of the Western theories of intelligence reflects that these theories are rooted in a positivist notion of knowledge and an empiricist approach toward its understanding. Except Piaget and Vygotsky who localized intelligence in action, majority of the researchers consider intelligence in terms of a disposition, ability or attribute of the person which is manifested in physiological, verbal and behavioural forms. It is also explicitly or implicitly believed and has served as a working assumption that there is considerable correspondence between the conceived ability and its objective or measured form. Probably, this is the basis why intelligence tests are used with confidence in assessing individual's worth and capability and making decisions in personnel selection, training, admission, etc. Further, the approaches to conceptualise intelligence are so diverse and are rooted in different metaphors that it is difficult to accept either view without biasing oneself in favour of it, as there is no theory-free criteria for such an evaluation. All the metaphors have their own rules of the game and allow the use of intelligence in a given way and achieving certain results which curtail many other possibilities inherent in the other traditions.

It may be mentioned that, despite diversities, most of the theories of intelligence go with the position that intelligence stands for adaptive potentiality of a person mainly in the cognitive domain. This adaptive potentiality may be thought of consisting of a range of skills that help one to overcome life problems, grow and become what one wishes to. These skills are distributed in the society and people internalise them, operate with them and in that process move to some other level in skills. Perhaps an intelligent person does not repeat himself or herself in performing some task. This also holds true for the Indian view on intelligence. A seer, for example, after having realised the lower order truth aims at the attainment of higher level. Thus transcending oneself is the continuous demand on an intelligent being.

Intelligence in the Indian philosophical treatises has been treated as a state, a process and an entity, the realisation of which depends upon one's own effort, persistence and motivation. This seems to be more or less similar to Piaget's *structuralism* where a person actively constructs his structures by operations and reflections. The realisation of higher level of intelligent functioning is somewhat similar to performing 'operations on operations'. Intelligence is a potentiality and opposes fate. It is said that just as a field sown

without seed is barren, without human effort there is no fate. An intelligent human being having realised higher order knowledge has been characterised as *mahakarta* (great worker) and *mahabhokta* (great experienter). Individuals at the lower level of intelligence are not able to see beyond what is present in their immediate world whereas an intelligent being also requires going beyond the immediate, realising the permanence and truth of the *Brahman*, the highest divine. He distinguishes between what is temporary (*anitya*) and what is permanent (*nitya*).

Intelligence has a deeper and wider connotation in Indian psychology. Of course, Indian psychology, in conformity with the Western concept, accepts intelligence as a power of the mind and highest power available to man at present. However, it does not accept it as the last power for man in his evolutionary growth. To Sri Aurobindo, an evolutionary philosopher of the present century, "The spirit that manifests in man and dominates secretly the phases of his development is greater and profounder than his intellect and drives toward a perfection that cannot be shut in by the arbitrary constructions of human reason" (Pani, 1987, p.360)

The cross-cultural studies of intelligence and cognition indicate that the different cultural groups have developed their own images of intelligence, intelligent behaviour, and intelligent people and skills. Though there is an overlap in their views, they also differ from each other in important ways. Even the lay people in the Western world do not converge in their meanings in the use of intelligence. The Indian view as presented here questions the univocal and unicultural view of intelligence. It may be mentioned that Western conceptualisation includes schemata, perception, memory, imagination, symbols, concepts, reasoning and problem-solving under the purview of intelligence. The Indian view uses the term *exclusively* for the power of reasoning and its allied mental activities.

It is interesting to note that, like Western thoughts, Indian philosophy emphasizes the role of genetic and environmental factors in determining one's intelligence. Anthropological studies indicate that Hindus harvest the reap of their own *karma* (deeds) and the *karma* passes through generations, from father to son and mother to daughter. Intelligence is seen as the result of one's own *karma* and the child inherits it from his/her parents. However, the activity or passivity of this genetic endowment depends upon the child's *karma*.

Recent developments in the Western notion of the concept of intelligence have emphasized intelligence rooted in specific physical and social environments. The Indian view has also highlighted the importance of *desh* (space) and *kala* (time) in an intelligent behaviour. According to *Yogavasishta*, a liberated being, which is the highest state of being an intelligent, behave with

his fellow-beings as the occasion and the status of the person demand, without least strain on his mind. Despite the fact that he is occupied with actions appropriate to the time, place and circumstances, he is not touched by pleasure or pain arising from them.

It may be noted that present discussion in indigenous view of intelligence is based upon very limited materials which by no means can be considered to be exhaustive. It may be worthwhile to explore culturally appropriate notion of intelligence by analysing the Indian intellectual tradition through texts, anthropological and sociological accounts, and available literature in psychology. Further, there is a marked change in the present day Indian society as compared to the traditional one due to urbanization, industrialization and social mobility. Many of the concepts/skills considered to be relevant for successful functioning in the traditional society seem to have undergone important transformations. It, therefore, seems essential to undertake studies of the concept of intelligence as used and understood by the lay-people. This should include sample from different regions and walks of life. This kind of endeavour would facilitate the refinement of the concept of intelligence and help to situate our studies in the socio-cultural context in a sensitive manner.

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# Induction of Concepts of Conservation of Continuous Quantities in Children An Experimental Investigation

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## Abstract

*The purpose of the present study was to examine the effect of Piagetian inspired teaching programmes on Indian elementary school children's acquisition of the concepts of conservation of continuous quantities. The experimental programmes involved the use of pre-post-delayed post-test design. The procedure of the study was sequenced into four phases. The first post-test was conducted immediately after the training sessions and after its three weeks second post-test was conducted. The data was analysed qualitatively as well as quantitatively. Results indicated that training programmes based on Piaget's theory were able to accelerate the acquisition of concepts of conservation of continuous quantities in children.*

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PIAGET advocates a curricular emphasis on learning mainly on how to learn and on a critical thinking as opposed to stress on accumulating readymade verbalized knowledge. This seems appropriate for education for this increasingly dynamic world of knowledge. In order to allow Piagetian theory to be used wisely and constructively in curriculum development and teaching, much research has been undertaken. This research has had its primary thrust on two areas of Piaget's theory. The first is concerned with the dynamic mechanism responsible for transition from one stage to another stage and the second with the acceleration of concepts of conservation of continuous quantities in children.

Some work in the area of accelerating cognitive development especially conservation concepts (e.g. Smedslund 1961, Bellin 1965, Mermelstein *et al.*



1967, Winer 1968, Rothenberg and Orst 1969) has been conducted in many countries, but it has been generally observed that little if any acceleration is possible (Flavell 1963, Brainerd 1978). However, a close look at these studies shows that the learning programmes have failed because they have ignored the postulates of equilibration model of Piaget's theory which clearly leads one to predict that success in learning studies would be achieved only when cognitive conflicts are inducted. In fact, studies conducted in Piaget's laboratory at Geneva by Apostle *et al.*, 1959, Matalon 1959 and Greco 1959 have indicated that success in accelerating conservation concepts can be achieved provided the training methodology used has a proper theoretical underpinning based on Piaget's theory.

Thus, the Piagetian notion of equilibration is assuming increasing importance in guiding the generation of instructional conflict strategies concerned with cognitive development (e.g. Inhelder and Sinclair 1969, Turiel 1969, Langer and Strauss 1972, Lefebvre and Pinard 1972, 1974, Inhelder Sinclair and Bovet 1974, Case 1977, Bevil 1978, 1980, 1982, Dasen *et al.* 1979, Rowell and Dawson 1981, Clemens 1984 and Parsonson and Naughton 1988).

One of the most systematic study has been conducted by Inhelder, Sinclair and Bovet (1974) with the aim to accelerate the conservation concepts in elementary school children through selected training programmes. It highlights the dynamic role played by the progressive coordination between various sub-systems during their construction. The coordination may lead to temporary disequilibrium which provides the impetus for new constructions. The disequilibria are experienced by a child as conflicts and contradictions. His efforts to resolve such conflicts leads to interaction between schemes and these interactions often result in compromise solution before he becomes capable of giving fully compensatory operatory solutions.

In the present study, Inhelder's *et al.*, (1974) study was repeated on Indian elementary school children with the view that the results of the present study could be useful to uncover the mechanism involved in cognitive growth of children and their use in fostering cognitive development in children. In particular, the implication of the findings for formulating curriculum programmes, providing stimulating environment for acquisition of knowledge and designing teaching-learning strategies can be far reaching.

### **Purpose**

The purpose of this study was to examine the effect of Piagetian teaching programme labelled "Concepts of Conservation of Continuous Quantities: From Observation to Inference" developed in Geneva by Inhelder, Sinclair

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and Bøvet (1974) on the elementary school children's acquisition of the concept of conservation of continuous quantities.

### Hypotheses

The hypotheses of this study were derived from the basic assumption that the acquisition of concept of conservation of continuous quantities can be accelerated through training programme.

1. There will be significant progress in the acquisition of Piagetian concepts of conservation of continuous quantities (liquid and clay) when the children are given training programme labelled "Concepts of Conservation of Continuous Quantities: From Observation to Inference."
2. Children who are given training programme labelled "Concepts of Conservation of Continuous Quantities: From Observation to Inference" will show significantly better progress in the acquisition of concept of conservation of continuous quantities (liquid and clay) than the children who are not given such training programme.

### Design

The experimental programme involved the use of pre-post-delayed post-test design.

### Procedure

The procedure of the study was sequenced into four phases.

During Phase one, 40 children (20 boys and 20 girls) studying in Ist grade in Bal Vidya Mandir of Lucknow city were taken. The children were ranging in age from 4:6 to 7:3 years.

In Phase two, each subject was pre-tested on concepts of conservation of continuous quantities, namely, liquid (Piaget and Szemnicka, 1941) and clay (Piaget and Inhelder, 1941). On the basis of the pre-test performance the children were divided into three broad groups, i.e. non-conservation (NC), intermediate (Int.) and conservation (C). The children who were found to belong to the intermediate stage were randomly assigned to experimental and control groups. However, this control group was named as Control Group I and was not given the training. The Control Group II\* included all children

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\* The responses of Control Group II are not given in this paper because they showed no change.

who were naturally conserved. These children participated in the training programme. All non-conservers were also included in experimental group and participated in the training programme.

In all, 28 children (15 girls and 13 boys) in the age range from 4:6 to 7:1 constituted the experimental group. Ten children formed Control Group I while two formed Control Group II.

In Phase three, the actual treatment programme (Inhelder *et al.*, 1974) was taken. The programme was of two sessions, each lasting from 20 to 30 minutes. There was an interval of a week between the two sessions. Control Group I received no lesson as placed but as usual attended its regular normal classes.

Phase four consisted of two steps post-testing. The first post-test was conducted immediately after the training sessions to investigate the effect of training programmes on the cognitive development level of the participating children. The second post-test was conducted three weeks later. The two conservation tasks of liquid and modelling clay were used (as in the pre-test).

#### *Conservation Pre-tests and Post-tests*

Each subject was administered two tests of conservation of continuous quantities, i.e. liquid and clay. There were three items in each of the two tests. Materials in the liquid test were two identical beakers with equal amount of coloured water, a tall thin glass, a short wide glass, and four small glasses each about a fourth the volume of the beaker; in clay test coloured plasticine balls were used.

At the start of each test, stimuli were presented so that they were perceptually and qualitatively equal. Thus, the equal amount of water was poured into two like beakers and the round balls of plasticine were the same. The subjects were asked if the stimuli had the "same or different amount"; subjects (Ss) who judged the stimuli as "same" watched experimenter alter one of the stimuli and were asked a series of questions. For example:

1. Have we both got the same amount, if we drank it.... or has one of us got more than the other...who?
2. (If S answered "same") "How did you come to know?"
3. (If S pointed out that one of us will have greater amount) "Why do you think so?"

Similar types of questions were asked in both the conservation tests.

## Training Procedure

**Material Used:** Three pairs of cylindrical jars are fixed to a frame made of two vertical columns (see Fig. 1). The jars are 7 cms high and their diameter is 5 cms. Both the top jars (A' and A) and the middle ones (B' and B) have an outlet tap at the bottom which the child can easily handle. The top pair of jars (A' and A) and the bottom pair (C' and C) remain unchanged during the experiment; the middle pair (B' and B) are sometimes replaced by other jars of different shape and size, either narrower (N: height 7 cms, diameter 3 cms) or wider (W: height 7 cms, diameter 7 cms). Two small flasks of different sizes (F and F') are used to pour equal or unequal quantities of liquid into the top jars.

**Training Sessions:** There were four phases in the experiment presented through two training sessions. Since the first phase was mainly intended to allow the S to become familiar with the apparatus and to draw his/her attention to the fact that the liquid flows from A to B and then to C, the S was asked to fill the larger of the two flasks (F) with liquid so that the ball of the flask was completely full, but the neck would remain unfilled then to pour the liquid from F into A, and finally to open the tap and let the liquid flow into B. He/She was asked to describe what had happened and to predict the quantity of liquid he/she would find in F if F were put in place of C. The S was next asked to let the liquid flow into F so that he/she could see whether his/her prediction was correct.

Similar procedure was followed for the second column, the sequence of events being  $F \longrightarrow A \longrightarrow B \longrightarrow F$ . The purpose of the second phase was to focus the S's attention on the fact that equal quantities of liquid at the beginning and the end rose to different levels in the middle pair of jars when these were not of the same shape or size (see Figure 1). Using the same flask F in each case the S was asked to fill A' and A. He/She checked that the two jars contained the same amount of liquid into N from A. ("Enough liquid so that there is the same amount to drink in B' and N"). The levels of the liquid in B' and N were carefully marked and the S was asked to predict the quantities of liquid in C', and C if he/she would let the liquid run through ("Will there be same amount of liquid in both jars, or more in one?"). The S then let the liquid flow down from B' into C' and from N into C. He/She could either make the levels in B and from N into C. He/She could either make the levels in B' and N equal, so that objectively, the quantities would not be equal in this case. When the liquid had run into C' and C, he/she saw that the quantities and the levels were unequal and that some liquid was still left in A or he/she could let all liquid run into B' and N, accept inequality of the levels, and finally end up with equal quantities and levels in C' and C. The same procedure was repeated taking W instead of N.

In the third phase, the S was asked once again to compare the amount of liquid flowing down in one column with that flowing down in the other. The middle pair of jars were hidden by a screen (see Figure 2). The S filled A' and A with the same quantity of liquid. He/She then saw that after the liquid had run through the middle pair of jars, the bottom ones, C' and C, contained equal quantities of liquid. When the liquid ran through once more, he/she was asked to predict the quantities in C' and C. After he/she saw what actually happened to the liquid and when he/she compared it with his/her own prediction all his/her reactions were noted.

The fourth phase pertained to the conservation of unequal quantities. The procedure of this part of the experiment was the same as that used in the second phase, except that the S filled A' and A with unequal quantities of liquid. A' was filled from flask F and A from a smaller flask F'. The difference in quantities was such that, when the liquid was in the middle pair of jars, B' and N, the levels were equal. At each level (A', B', C') the S was asked to compare the quantities in various containers.

### Analysis of Data

The data was analyzed qualitatively as well as quantitatively. For quantitative analysis two statistical tests — Z values for testing the hypothesis and test of a difference between uncorrelated proportion — were used.

### Results

For a qualitative analysis of the children's responses and in order to characterize the individual progress five categories as suggested by Inhelder, Sinclair and Bovet (1974) were used and presented in Table 1.

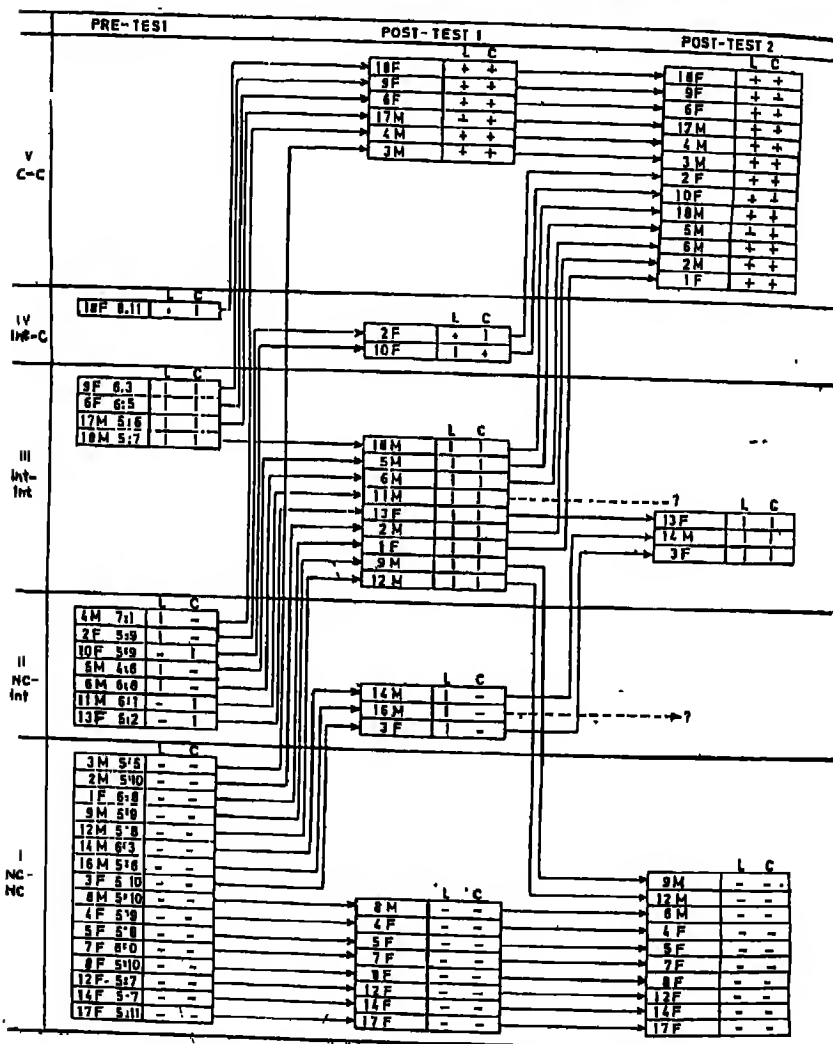
Of the sixteen children who were at pre-conservation level before the training sessions eight did not show any progress at all. One child (3M, 5:8) made substantial progress and achieved the conservation level after exposure to the training programme (Post-test 1). The child remained at this level at the second post-test. Four children reached Level III at the first post-test. Two of them (2M and 1F) further progressed to Level V while other two children (9M and 12M) regressed to its initial level, i.e. Level I at the second post-test. The remaining three children progressed to Level II at Post-test 1, two of them (14M and 3F) making further progress at Post-test 2. One child (16M, 5:8), however, was not given Post-test 2.

In the sub-group, whose initial level was II, NC-Int, One child (4NM, 7:1) progressed to Level V at Post-test 1 and remained at this level at the second post-test. Two children progressed to Level IV at the Post-test 1 and continued to progress to Level V at the second post-test. Of the four children, who

# CONCEPTS OF CONSERVATION OF CONTINUOUS QUANTITIES IN CHILDREN

TABLE 1

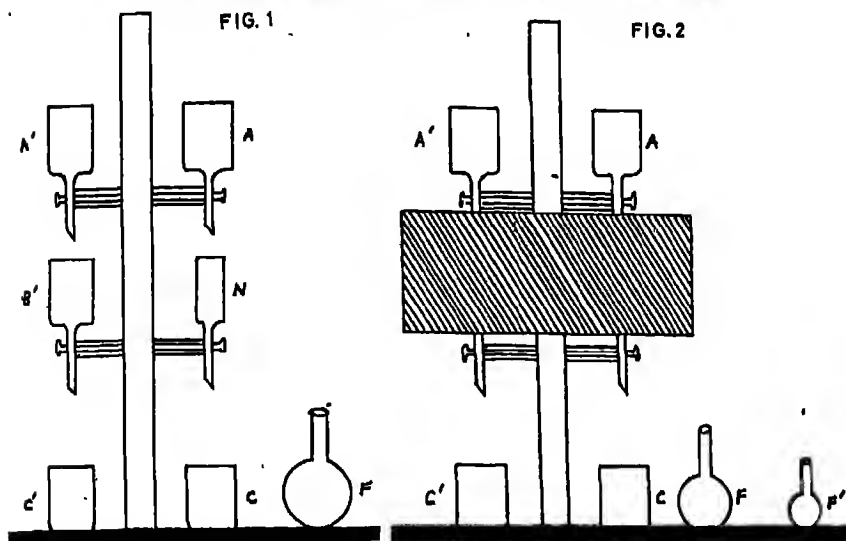
Progress/Lack of Progress of the Experimental Group Ss\* from One Stage/Sub-Stage to Subsequent Stages/Sub-Stages after the Training Programme



L=Liquid conservation task; C=Clay conservation task; - = NC response; I= Int response; += C response; M= Male subject; F=Female subject; Subjects are identified by numbers 1,2,3, etc.

TABLE 2

Progress/Lack of Progress of the Control Group Ss from One Stage/Sub-Stage to Subsequent Stages/Sub-Stages for the Training Programme



L=Liquid conservation task; C=Clay conservation task; - = NC response; I= Int response, += C response, M= Male subject; F=Female subject; Subjects are identified by numbers 1,2,3, etc

	PRE- TEST	POST-TEST I	POST-TEST 2																																								
II Int - Int	<table><tr><th colspan="2">L C</th></tr><tr><td>19M 7.3</td><td>I I</td></tr><tr><td>20M 5.10</td><td>I I</td></tr><tr><td>11F 5.5</td><td>I I</td></tr><tr><td>20F 5.5</td><td>I I</td></tr></table>	L C		19M 7.3	I I	20M 5.10	I I	11F 5.5	I I	20F 5.5	I I	<table><tr><th colspan="2">L C</th></tr><tr><td>19M</td><td>I I</td></tr><tr><td>20M</td><td>I I</td></tr><tr><td>11F</td><td>I I</td></tr><tr><td>20F</td><td>I I</td></tr><tr><td>7M</td><td>I I</td></tr></table>	L C		19M	I I	20M	I I	11F	I I	20F	I I	7M	I I	<table><tr><th colspan="2">L C</th></tr><tr><td>19M</td><td>I I</td></tr><tr><td>20M</td><td>I I</td></tr><tr><td>11F</td><td>I I</td></tr><tr><td>20F</td><td>I I</td></tr></table>	L C		19M	I I	20M	I I	11F	I I	20F	I I								
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progressed to Level III at Post-test 1, two made further progress to achieve Level V whereas one remained stable at Level III. One child was not given the second post-test.

In the sub-group, whose initial level was III, Int.-Int., three children made considerable progress to reach Level V at the first post-test and remained stable at this level at the second post-test. However, one child (18M 5:7) made delayed progress reaching Level V at the second post-test.

One child (18F, 6:11) in sub-group IV reached Level V at the first post-test and remained stable at this level at the second post-test.

Results of qualitative analysis show that intervention programme leads to progress in the acquisition of the concepts of conservation of continuous quantities but it does not reveal whether the progress made is significant or not. However, in order to make a firm decision that the progress made by children is not a chance event, it is necessary to subject the results to statistical analysis. Thus, Z values were computed and presented in Table 3.

TABLE 3

**Z Values of Proportion of Progressed Children to the Experimental and Control Groups and their Comparison for the Training Programme**

	<i>State I: Pre-test Post-test 1</i>	<i>State II: Pre-test Post-test 2</i>	<i>State III: Post-test 1 Post-test 2</i>
$\pi_0 = .75$			
Experimental Group	-0.88	-1.60	-3.12**
Control Group I	-4.78**	-5.51**	-5.51**
$\pi_0 = .50$			
Experimental Group	1.89*	1.17	-0.45**
Control Group I	-2.53**	-3.16**	-3.16**
Difference between Experimental and Control Groups	2.59**	3.17**	2.74**

\*  $p < .05$

\*\*  $p < .01$

When  $\pi_0 = .75$  was used as a cut-off point, the results (see Table 3) revealed negative and insignificant value ( $Z = -0.88$ ,  $Z = -1.60$ ,  $p > .05$ ) for the experimental group in the case of first two states, while for the third state it was negative and significant ( $Z = -3.12$ ,  $p < .01$ ). For the control group, values at all the three states turn out negative and significant. All in all no significant progress for the experimental as well as control groups was indicated when more stringent cut-off point  $\pi_0 = .75$  was used.



Using  $\alpha_0 = .50$  as cut-off point the results (see Table 3) revealed positive and significant value at State I, positive and insignificant value at State II and negative and insignificant value at State III for experimental group. While for the control group values turn out negative and significant for all the three states. The results on the whole indicated significant treatment impact on the experimental group, whereas no significant progress was recorded for the control group.

When the progress for the experimental and control groups were compared and examined results turned out to be positive and significant ( $Z = 2.59$ ,  $Z = 3.17$ ,  $Z = 2.74$ ,  $p < .01$ ) in favour of the experimental group in all the three states indicating thereby significant training effect on experimental group.

### Discussion

Results of the present study confirm the assumption that one can hope to observe acquisition process at work in the individual child in case training procedure is based on Piaget's theory. Thus, the training programme labelled "Concepts of Conservation of Continuous Quantities: From Observation to Inference" supports the importance of conflicts between schemes for all progress in (Ss) showed progress immediately after the training sessions.

Previously, Smedslund in 1963, and Inhelder and Sinclair in 1969 found prediction outcome conflict, based on Genevan model, effective in accelerating conservation concepts. The present study also involves this type of conflict. It assumes that a child's action should result in feedback, which does not fit with the intellectual structure that gives rise to these actions. This lack of fit could perturb the mental structures, thus inducing a state of disequilibrium.

Bevill, in 1980, found that Piagetian concept of speed can be taught to Indian children by giving direct perceptual experience and conceptualizing it by verbalization to the child. Thus, the theoretical base of her study was Harvard Model given by Bruner (1966). The conflict which Bruner describes is not between the structure and the retroactive feedback as the Genevan model would have it, rather the conflict is between products of the structure, e.g. the ikonic and the symbolic modes. In effect, there is an interaction between modes of representation (ikonic, symbolic, and enactive) which are external to the structure.

The results of the present study confirm the equilibration theory of Piaget. Similar to the present study Lefebvre and Pinard in 1974, and Case in 1977 found that conflict training, which was based on Piaget's equilibration theory and designed to induce subjective uncertainty, is effective in accelerating cognitive development. The present study is also supported by Rowell and Dawson (1981), who found that the acquisition of the concept of conservation

of volume can be accelerated through the appropriate conflict teaching based on Piaget's theory of equilibration to which Strauss (1972) calls organizational disequilibrium. Organizational disequilibrium refers to a child's structural organization. Piaget (1970) and Turiel (1969) have described structural organization where a child possesses at least two functional structures of reasoning. Using the theoretical base of organizational disequilibrium, Rowell and Dawson have discussed that a child possessing the relevant schemata, but not evoking them and/or appreciating their conflict in response, recognizes them during training programmes and subsequently resolves them, thus attaining conservation stage which is retained till delayed post-test.

The present study is consistent with that of Rowell and Dawson's study in reference to results and theoretical base of organizational disequilibrium. In the present investigation during the training procedure if any prediction of the child came into conflict with the outcome, it would result in triggering off disequilibrium. The child would then either notice the left water in the upper jar or would recall the equal or unequal level poured into the upper pair of jar. He/She then would assimilate various contradictory observables (judgements) and compare them, understand the covariation of dimensions and finally be able to make inferences "If the liquid is equal in the upper pair of jar, it would remain equal throughout despite the apparent transformation brought about in the levels". In this manner the schemes would get coordinated in a pre-coordinated system and higher level of equilibrium would eventuate. The results, thus, are being corroborated by Inhelder *et al.* (1974) study.

In the present study, very few children who had yet not reached an intermediate stage at the pre-test, made progress during the training sessions. They gave no sign of conflict between the idea that it is necessary to let the total quantity of liquids from the top glasses flow through the bottom glasses and the judgement that the higher liquid level in one of the glasses denotes greater quantity. Since these children have not received training in problems with discontinuous quantities, they had not encountered such conflicts in this easier situation, consequently, when faced with the more difficult task, they did not have a heuristic conflict model at their disposal and therefore did not question their expectation when they found that the levels in the glasses C and C' turned out to be equal, they simply made ad hoc corrections without modifying any of their previous judgements or attempting a new approach to subsequent problems. Their lack of awareness of contradictions was striking, since the experimental situations provided a sort of illustration of the operations underlying conservation, i.e. identifying or annulment or compensation. Such behaviour provides further evidence to the general hypothesis that observable features become pertinent (i.e. actually help a child to develop his reasoning) only in so far as they can be integrated into inferential mechanism.

By contrast, those children who had already given contradictory, conflict provoking answers benefited from prediction-outcome type of training and in the post-test they proved to have acquired the concept. Examining their reactions during the training sessions, it was found that they constructed a series of inferences from their observations and noticed both contradictions and inconsistencies. The very fact has been supported by Inhelder *et. al.* (1974).

So it can be concluded that the nature and extent of subjects', progress were found to be dependent on their initial development stage. Table 1 makes it clear that out of sixteen non-conservers only three Ss reached the conservation stage while ten out of twelve intermediate Ss reached at this stage. It, thus, appears that progress depend on the assimilatory instrument that the subject has at his/her disposal. Bevil (1980) also reported that improvement towards conservation seem to depend upon stage at which the child is, where training is concerned.

The major implication of this study is on designing and development of appropriate teaching-learning strategy for children. The result of the study indicate that the child's readiness to learn is a prime criterion in deciding when to introduce a certain curriculum experience. Thus, the study is useful for curriculum planners.

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# **Instructional Materials to Promote Children's Creativity in Classroom: Studying the Effectiveness of Materials Fostering Creativity**

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## **Abstract**

*This paper has two parts. The first part presents a critical review of some creativity training materials developed in India and abroad and brings into light the need for developing indigenous materials for teachers to nurture creativity among elementary school children in usual classroom teaching-learning. The second part highlights the assumptions and the procedure involved in the development of a multimedia package designed by the Department of Educational Psychology, Counselling and Guidance, NCERT. It also presents a small study which provides some evidence of the effectiveness of exemplar activities of the print part in improving student's level of creative thinking and bringing about some behavioural changes in student's ways of thinking, asking questions and solving problems. The paper also suggests a comprehensive research on the complete package on a wider sample with better design controls.*

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Much has been written in recent years and in the past concerning whether or not people can be trained to enhance their creative thinking skills and qualities. The issue is inextricably bound with the controversy whether creativity occurs only in special individuals like Edison, Einstein, Mozart, Picasso or is it a normative process available to every thinking human being:

be it in an adult or a child (Tardif and Sternberg, 1988). According to the latter view, creativity processes can be trained and improved (Taylor 1988; Torrance, 1988). Training, however, is not possible and creativity is achieved only when the right combination of particular problems, skills, individual and social milieu comes together (Barron, 1988; Gurber and Davis, 1988; Hennessey and Amabile, 1988).

Views and findings on the subject continue to be under debate due to the multiplicity of angles from which creativity is viewed, the type and the level of creativity in question. From nature-nurture point of view, however, the most favoured explanation is that although genetic endowment is important, environmental factors simulate the development of creative potential. Creativity demands the capacity to think of ideas in novel ways, branch out from the conventional, see unusual implications, adopt alternative ways of thinking when old ones fail, see new relationships between unrelated things to arrive at original ideas etc. The development of these skills and abilities depends on the extent the individual is exposed to an array of unconventional experiences (McLeod and Cropley, 1989). The weight of evidence suggests that some deliberate instruction or training can help people become better creative thinkers and creative problem solvers. Despite some early reviews which expressed skepticism (Mansfield, Busse, and Krepelka, 1978), extensive research supporting this assertion has been reported (Stein, 1974, 1975, Feldhusen and Treffinger, 1985; Feldhusen and Clinkenbeard, 1986; Feldhusen, 1988, 1990; Parnes, 1987; Torrance, 1972, 1987; Vengundy, 1987).

A variety of instructional materials and programmes, both short-term and long-term, have been developed for training creative thinking, critical thinking, creative problem-solving in educational settings though mostly in the West. Some of these are available commercially in published form. Others have been developed for experimental use. Treffinger and Gowan (1971) and Treffinger (1977) have provided an extensive bibliography of methods, techniques and educational programmes for creativity development. Henslowe (1986) also listed about 150 practical materials suitable for use with youngsters. These include teacher's guides, activity books and curriculum kits. Many of these concentrate on thinking skills; fostering creativity, encouraging fantasy, promoting the ability to perceive problems, feelings of self-worth, etc. A recent survey of published "Thinking Skills" resources (Treffinger, Feldhusen, Isaksen, Cross and Remle, in press) reviewed and located more than 200 additional published materials.

### **Reviews of Related Research**

A critical review of related research literature reveals that the initial development of instructional materials in the 1960s paved the way for the

development of other complex models and programmes in the 1970s and 1980s. During the sixties, however, a series of Idea Books (Myers and Torrance, 1964, 1966), the Classroom Ideas Programme (Williams, 1970), the classroom materials based on Taylor's (1968), Multiple Talents model and Purdue Creative Thinking Programme (Feldhusen et al., 1969) were developed. During the seventies and eighties, there was truly a profusion of activities related to the development of instructional materials on creative thinking. The Creative Problem Solving Programme (Noller, Parnes, Biondi, 1976) involving a variety of specific strategies for creative and critical thinking, the Productive Thinking Programme (Covington, et al 1972), the William's (1972) package, Khatena's (1973) Training Method and de Bono's lateral Thinking Programme (1970, 1975, 1976, 1978) are well-known. A number of other educational programmes including Future Problem Solving Programme (Torrance, Bruch and Torrance, 1976), Odyssey of the Mind (Micklus, 1984) the Multiple Talent's (Taylor, 1986; Schlichter, 1986), the Tactics for Thinking Programme (Mazzano and Arrendondo, 1986) and Torrance's Incubation Model of Teaching (1990) all had their origins during this era. These programmes vary widely along several dimensions including size, scope, complexity and research support and range from exclusive focus on divergent thinking processes to an emphasis on multiple criteria in nurturance of both divergent and convergent thinking, problem-solving and decision-making. A few programmes have been field tested, evaluated and used in experimental research studies, although the majority appear to have been published with little or no-field testing or research to support their effectiveness.

One can, however, cite some evaluative studies in the professional literature, on the effects of various training programmes on creative performance under different environmental conditions. Mansfield, *et al.* (1978) in their review of five relevant creativity training programmes, indicated that Osborn-Parnes Programmes and the Khatena's Training Method have the most convincing records. The Productive Thinking Programme could only provide modest evidence of the programme's effectiveness. For Myers-Torrance workbooks, there is no evidence that the workbooks improve performance. Torrance (1972) evaluated some 142 studies and maintained that the most successful approaches seem to be those that involve both cognitive and emotional functioning, provide adequate structure and motivation, and give opportunities for involvement, practice and interaction with teachers and other students. Motivating and facilitating conditions certainly make a difference in creative functioning but differences seem greatest when deliberate teaching is involved.

Research with most of the instructional programmes have established that students at many ages could improve their ability significantly to introduce

many varied and original ideas (Torrance 1972, 1987). The results, however, vary depending upon the type and nature of training procedure used, length of the training period, methodology used in evaluation, extent of teachers' involvement in training, the age group, the task/tools used in evaluation and the statistical analysis applied. Cropley and Feuring (1971) showed that the results of such training are not necessarily simple, or direct. What was effective with girls was not necessarily effective with boys, while the effects of training depended largely on the conditions under which criterion data were obtained. Raina (1991), in this context, also observed that the complexities involved in creativity development would indicate that there is no single direct approach and that one technique may profit one person but not another. According to Treffinger, *et al.* (1993) the recent challenge confronting researchers is how best to nurture creativity rather than whether or not it is possible to do so. Hence increased understanding is needed about ways to make instructional materials more responsive to the needs, learning styles and unique characteristics of the learners.

In India, only some sporadic research and developmental work has been done in this area. Nirpharake (1978) devised some strategies and material for training children in observation, inquiry, divergent production and appreciation. D'lima (1982) developed simple techniques based on brain storming, analogies, simulated games, role-play etc. Bhaskara (1990) based on his doctoral work, developed a set of instructional materials in the Kannada language for use in Class VI largely in the form of stories, riddles, puzzles, problem solving exercises and mystery plots. These materials after field testing were found effective raising the creativity scores of students both in rural and urban areas. None of these materials, however, are widely available to teachers for use in classroom situations.

Raina (1991), on the basis of analysis of doctoral thesis, reported that relatively little research has been done in India on nurturing creativity through various procedures. According to him, the 16 studies classified in this area provide hardly any firm basis for determining the effectiveness of procedure(s). He further speculates, "Is this because promoting students creative thinking and problem solving abilities has not been considered a viable educational goal" (p. 480).

A survey of 18 schools — the Government, Public, Central, Navyug and DAV schools including some progressive schools of Delhi — revealed that while 80 per cent of teachers do value the importance of developing creativity in students, they are not aware of what strategies to follow. Only 15 per cent of teachers reported that they try to use certain creative activities in school but not in teaching-learning situations. 75 per cent teachers, however, expressed their desire to undergo professional training and have access to materials so



as to know about the practical ways to promote creativity in children (Gulati, 1993).

The review of research literature, findings of the above survey and follow-up of a series of training courses for teacher educators organised by the Department of Educational Psychology, Counselling and Guidance (Gulati, 1989) provided impetus to develop an indigenous set of exemplar materials in the form of a multi-media package which could be made available for training teachers, both pre-service and in-service, to encourage creativity in elementary school children.

## PART II

### Development and Field Testing of a Package to Foster Creativity

A package has been specifically designed by the Department of Educational Psychology, Counselling and Guidance, NCERT to help teachers develop certain creative thinking skills, attitudes and qualities in upper primary school children. The development of the package rests on the following assumptions:

- All children are capable of developing the skills, the attitudes, the motivations and the qualities required to be creative to some extent. Not every student will develop to the fullest advantage but someone might and almost certainly more will do so.
- Creativity arises from the complex interactions among the personal characteristics, processes and the situational factors—the full 'ecological system' (Treffinger, *et al.* 1993) and that development and use of instructional materials is only a part of the nurturing strategy (Raina, 1991).
- Encouraging creativity in classroom is not only concerned with cognitive development but also with affective development—the development of self-confidence, independence, motivation, interest, perseverance, etc.
- Development of creativity in classroom does not only fully facilitate children's overall personality development but also makes the teaching-learning process more joyful, meaningful and child-centred. This also enables teachers to develop in themselves certain desirable attitudes and qualities to enhance their personal and professional growth. The paradigm is best shown through a diagram.

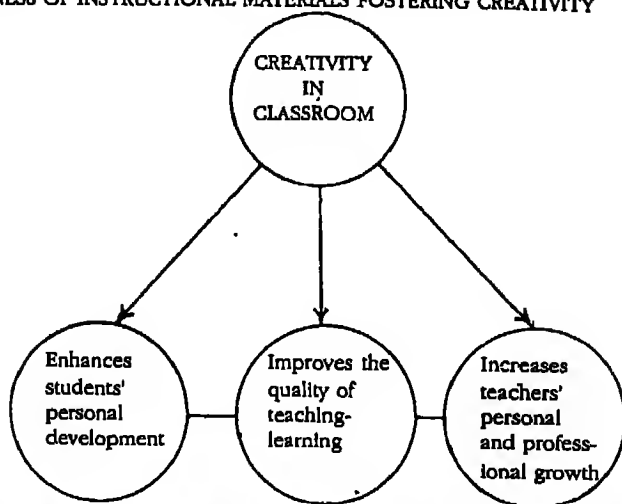


Fig. 1 A Model Underlying Development of Creativity in Classroom

The primary goal of this package is to provide a practical and workable set of strategies and activities which can be used in classroom situations. Theoretical concepts, discussions and issues arising out of various researches have been purposely avoided. For conceptual clarifications and detailed presentation of various aspects, a Resource Book on 'Education for Creativity' can be used as a supplement (Gulati, 1993, in press). However, to make the package self-contained, essential concepts and perspectives have been briefly presented along with the general strategies.

The package consists of a guide book\* having 60 exemplar activities in printed form with attractive titles to each and a set of four audio and one video programmes\*\*. Audio and video inputs aim to serve as adjuncts to enhance the effectiveness of the print materials. The contents of audio and video programmes focus more on live or simulated situations to depict teacher's role as a facilitator. The observable effect of different strategies and teachers' attitudes on students' behaviour, process of learning thinking styles, ways of questioning and problem-solving are highlighted in these programmes.

The variety of exemplar activities included in the guide book were developed/adapted for use by teachers in teaching different subject areas from 5th to 8th grade students, based on the ideas available in the literature (Torrance, 1972, 1990; Williams, 1972). Some of the lesson ideas were taken from the William's package (William, 1972) and field tested. However, all the

\* The guide book is under finalization for printing.

\*\* The audio and video programmes are also under production.

activities were tried out on the students in actual classrooms to assess whether these turn out to be workable in our setting and are suitable for the grade levels for which these were designed.

The exemplar activities in the package call into play a range of thinking processes, abilities and qualities. Almost all the activities are open-ended and permit students to think of a variety of answers/ideas though in some cases, they have to arrive at the correct answers to verify their guesses against the facts. Some activities are more suitable for simulating flexibility, while others are meant to promote originality, and still others lead to greater elaboration of ideas. Overall, these activities require children to guess, explore, imagine, think of unusual ways to solve problems, complete the unfinished tasks in their own ways, suggest modifications, carry out transformations, combine and recombine ideas, ask unusual questions, see unexpected relationships among things, experiment, visualise, make predictions about future and simultaneously learn the contents. In line with the suggestions of some researchers (Torrence, 1972; Williams, 1972; Mcleod and Dropley, 1989), activities to foster creativity which can be applied to school work and relate to things students do in class would be more effective. In this study activities which can be integrated with the curricula have been developed. A wide range of strategies and techniques have been employed. Besides the use of art, craft, role play, story-telling techniques which are more suitable for the lower age group, creative writing, brainstorming, questioning, attribute listing have also been used.

Although activities are largely verbal in nature some non-verbal activities have also been included. A few verbal activities require oral expression whereas others have to be answered in writing. Each activity bears an interesting title followed by objective(s), procedure, expected outcome, notes and practical guidelines for teachers. The activities are not prescriptive to be dutifully followed from the beginning to the end and to be used by all in the same and in all kinds of settings. Teachers can modify them according to the situation and also expand their repertoire of teaching practices based on the strategies involved.

To give the readers some ideas about the exemplar activities, a few sample activities are given:

- While teaching the lesson on punctuations the teacher asks the children to list all the different kinds of traffic signs, for example, stop, go, slow, and then to find out possible similarities between these signs and punctuation marks used in writing.
- Students are asked to think of unusual uses of some throw-away objects. Same activity can be expanded to SUPW where children

- actually try to improvise materials and throw-away objects by combining them to make a new product.
- Teacher reads a story to the class and stops leaving it unfinished at a strategic point where some creative solutions are called for to solve the problem. Children are encouraged to come out with original solutions and complete the story in their own way.
  - To encourage visualization, the teacher asks the students in a lesson on excursion into space. How many different kinds of things can they list which they would like to put into the pocket of their space suit if they were going to the moon?
  - The teacher teaching about different seasons and how these change, asks students to imagine, "How would our lives be different if we had no changes of seasons?"
  - While dealing with measurements, the teacher encourages students to design a new and unique system for measurement of heights so that even a blind person who had never experienced heights could understand it.
  - While teaching the lesson on living and non-living things, the teacher asks the children to find out in what ways they are different, further poses questions which bring forth inquiry, exploration and arousal of curiosity. For example, in what ways the humming bird and helicopter are alike and different. Which would you rather like to be?

### **Effectiveness of the Print Part of the Package**

A small study was conducted to test the efficacy of the exemplar activities included in the print part of the package and see whether these improve students' level of creative thinking. Forty-two students (boys and girls) of Class V from a Central School comprised the sample. As the purpose for which the study was conducted was limited and less formal, a sophisticated design was avoided. Simple prepost comparisons were made in terms of variety and quality of ideas produced by children to find out whether some positive increments in performance can be shown between pre and post tests. Besides this, an attempt was also made to find out teachers' perceptions about the usefulness of the activities for children, their attitudes towards the potential of such activities to provide support to the teaching-learning process and also their readiness to adopt such activities in teaching.

Analysis was also made of many subtle yet observable trends taking place which indicate behavioural changes in students like children's ways of thinking, solving problems and questioning, teachers' attitudes and feelings

towards children and so on. Such data were also important from the teachers' point of view so as to find out whether efforts expended on students were worthwhile.

### **Procedure**

The investigator met the teacher of the concerned class to discuss the purpose of field testing, orient her about the nature of activities to be tried out and her involvement during the training period. Some warming-up activities on the part of students were also considered necessary to offset children's traditional styles of thinking and learning and to motivate them to think creatively. Reference was also made to the creative achievements of great people, and the importance and need for creative thinking in the present-day world was highlighted.

Prior to introducing the package of activities, one verbal and one non-verbal test, namely, Alternate Uses Tests (Guilford, 1971) and Parallel Lines (Torrence 1972, 1987) were administered as pre-tests. Thereafter, a variety of activities, as many as 40, involving different creative thinking processes were administered to students over a period of one month with the help of the class teacher. For about 20 days of the training period, one activity normally completed within 40 minutes was administered each day. In the remaining ten days, two activities requiring lesser time were conducted each day.

After the intervention was over, two tests, from Torrance's battery, namely unusual uses and circles were given as post-tests. Avoiding start time limit about 10 to 12 minutes were given for each of these tests (Wallach and Kogan, 1965).

Care was also taken to select the post-tests which were not similar to the activities used in training/intervention. This was to avoid the usual criticism that significant improvements are bound to happen if training and evaluation procedures involve the same tasks (Rump, 1979; Stein, 1985; Raina, 1991).

Both pre- and post-tests were scored for flexibility and originality following the procedure given in the manual.

### **Results**

The 't' test was applied to find out the significance of differences between the means of pre- and post-tests for both verbal and non-verbal flexibility and originality scores. Results are presented in Table 1.

Table 1 reveals that differences between the mean scores of pre-test and post-tests are consistently significant as indicated by their respective 't' ratios both in case of flexibility (verbal and non-verbal) and originality (verbal and non-verbal). It may be seen that the difference between the two means is more pronounced in case of verbal than non-verbal measures.

TABLE 1

Significance of Differences between Means (t-ratio) of  
Pre-test and Post-test Scores (N=42)

	Pre-test		Post-test		t-ratio
	Mean	S.D.	Mean	S.D.	
Flexibility (verbal)	1.8	.85	3.8	1.7	6.80
Flexibility (non-verbal)	5.6	2.7	7.8	2.4	4.07 *
Originality (verbal)	1.0	.75	2.80	1.5	6.98 **
Originality (non-verbal)	4.6	2.0	6.2	2.6	3.16 *

\* Significant at .05 level

\*\* Significant at .01 level

However, the rate of increment in mean scores from the pre-test to post-test as shown in the graph (Fig 2) is more or less uniform in case of both verbal and non-verbal flexibility and originality.

The results do provide some evidence of the facilitating effects of the package of activity on the development of creative abilities, namely, flexibility and originality. Although researchers have by and large indicated that training effects are more easily observable in case of flexibility than originality but present results indicate significant effect of training on the measure originality also. This could be possible because the activities involving creative thinking were integrated with the curriculum areas and might have proved more meaningful in terms of their impact on students. Torrance and Gupta (1964) also reported significant growth on several measures of originality due to training. Another explanation could be that there might be consistent relationship between the number of alternatives produced and the originality of responses. Thus the procedures/activities while enhancing flexibility also enhanced originality.

The measures of flexibility and originality are generally criticised as not the only criteria of creativity (Wallach, 1970; Crockenberg, 1972; Tannenbaum, 1983). Runco (1990) however reviewed the literature on divergent thinking among children and concluded that such measures are useful in studying creativity.

Moreover, the flexibility and originality in thinking encompass a variety of psychological functions and processes such as looking at the same thing in different ways, seeking alternative ideas and solutions, discarding old ideas, breaking away from the obvious, stretching one's imagination, forming

# EFFECTIVENESS OF INSTRUCTIONAL MATERIALS FOSTERING CREATIVITY

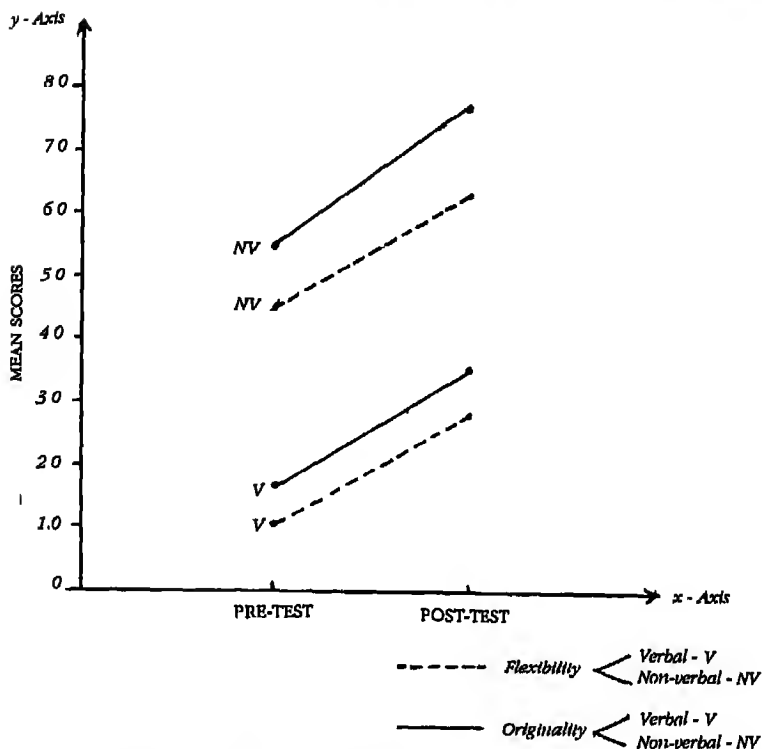


Fig. 2 Graph of Mean Scores of Pre- and Post-tests on Flexibility and Originality

new associations, being open-minded and receptive to new ideas, producing novel and unique ideas and so on. If the training materials are designed to enhance such creative thinking processes, skills and attitudes, it is perhaps valid to assume, on the basis of the present findings, that the materials have shown their value in stimulating creative thinking. One can't, however, assume their long-term effects and generalisability in real life situations.

Analysis was also made of teacher's responses on a questionnaire which consisted of two parts. The first part was concerned with finding out the suitability of the activities which was given to teachers after every activity. The second part consisted of questions to ascertain the impact of the activities on students and the teaching-learning process which was given as soon as the training inputs were over.

The analysis of teacher's responses revealed that students enjoyed doing all the activities. As the training proceeded, they became more participative, eager to learn and were seen more absorbed in their work. These activities

worked like a 'tonic' for them. Students became more curious to know about their surroundings. They learnt to ask more questions, may be these activities taught them to do so. Even the dull, inactive students actively participated especially in group activities. Teaching became easier. Children themselves learnt with little guidance.

The results support the assumptions and findings of earlier researches (William, 1972; Deshmukh 1984; Torrance, 1990) that activities and materials fostering creativity have inbuilt component of maintaining interest, developing curiosity, fostering independent thinking, encouraging imagination among children and therefore prove effective in teaching-learning.

Looking into the test data and teacher's perceptions, one does find some evidence of the short-term impact of the activities designed to foster creativity in students. The effects, perhaps, could be far reaching if such activities are entwined through the school curriculum. However, the author is fully conscious of the limited sample and duration of the training period. The teacher might have also been carried away by her enthusiasm by the kind of activities which provide novelty and variety in teaching. In view of these limitations, it seems that a comprehensive research on the complete package involving a larger sample of students and teachers, better design controls, using a variety of criteria, over a longer period of time would certainly be more promising to extend our understanding of the generality of its effectiveness. It would also be interesting to probe further and know 'what works best, for whom and under what conditions' as suggested by Treffinger et. al. (1993).

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# Value Clarification Strategies in India

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## Abstract

*This paper deals with values and value clarification. It is divided into two parts. The first part dwells on values in the Third World with special reference to India and value clarification in India. The second part deals with a comparative study of two models of value clarification for developing value clarification of college students in India.*

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VALUE simply refers to objects that the human beings cherish and desire and also consider as desirable. Education in very general terms is a process of bringing about desirable changes in behaviours of the learner — in the way he/she thinks, feels and acts in accordance with a standard or norm which is the concept of good life. In other words, it is a process of developing in the child knowledge, skills, attitudes, values and behaviour patterns that are considered as desirable for him/her to have both as a human being and member of the society. The goals and aims of education that have been stipulated for individual and the society development of human resource—creativity, commitment to human value and social justice, national cohesion, scientific temper and independence of mind, spirit, socialism, secularism, democracy — are no more than educational expressions of the concept of good life. Thus, education in its aims, curriculum, and also in its methods is linked with values. Even more, it is through education that the human society seeks to preserve and promote its values.

The modern youth is suffering from what is known as value conflict. The present society is facing problems of casteism, communalism, regionalism and untouchability which are destroying the basic values of justice and human

dignity. The social customs, traditions and religions must not be subordinate to human dignity, yet they are to be preserved in such a way that they could promote basic human values. In these circumstances individuals' freedom, demand of the society and demand of the nation should be integrated in such a way that all will get proper respect without doing harm to others. This is possible when individuals intellectually come to discuss among themselves and consequently compromise among different values.

Traditionally value development programme in teacher training involves two types of strategies: (i) direct exhortative, and (ii) indirect through activities and programmes.

Direct exhortative method involves (a) oral preaching, sermonising, lecturing by professionals, teacher, students, and (b) written literature like stories with morals, biographies of great men, exhortative writings, religious literature and fiction.

Indirect method involves various projects and activities through which values are developed. In addition the influence of the personality of the teacher and his personal example count much in shaping the character and the personality of the educands. Generally, programmes carried out in the educational institutions are: Assembly, Formal Study, Social Service, Curricular Activities, Cultural Activities, Aid — Trainees Services and Projects.

In today's classroom at all levels the activities are designed and carried out with a view to developing, in general, the scholastic achievement of students. This is also achieved through the use of unstructured lecture method. The teacher in the classroom attempts to cover the syllabus prescribed by the respective board/university. He/she hardly finds time to go outside the syllabus and, therefore, there is less scope of developing the students' cognitive domain to the extent that he/she can use it in day-to-day life for solving the problems encountered by him/her and in taking decisions at various stages of his/her life. That is to say, at present there are few students who can clarify their stance in a particular situation. On the other hand, large number of students do not seem to possess this ability. Sometimes they do not bother about it or they are so much overloaded with non-academic activities that they do not find time and many a time the opportunities are not provided for developing an analytical mind. Today's world is more complex because of explosion of information and population. Therefore, it is very essential at this juncture to give some training in the process of value clarification to the students studying in schools/colleges.

Value clarification as a movement originated in the mid 1960s and since that time it has become widespread. The term 'value clarification' was first used by Rath. Rath (1966) defined Dewey's ideas and created value clarification based on the recorded thoughts of great philosophers. In this the role of the teacher is to help the child, clarify his or her values.

The process of value clarification consists of a variety of structured experience, e.g. fantasies, role playing, checklists, drawing, small group tasks and problem solving activities. Some of these structured experiences have originated in classrooms, clinics or workshops, some are designed by the pioneers in the humanistic education, some are adopted from classic textbooks, and others are modifications of standard activities related to human training. Most teaching and training techniques can be incorporated into a value clarification programme.

Recognizing the need of developing value clarification, various researches have been conducted wherein different strategies, approaches, methods, or models have been developed and compared, at least, in terms of value clarification. Value Clarification Programme (Gorsuch, Arno and Bachelder, 1976; and Kelley 1976), Value Clarification Group Activities (Hobster, 1980), Value Clarification Classes (Sklare, 1974), and Value Discussion Model (Singh and Singh, 1986; and Singh, 1987) have been tried out. In all these studies treatment was found to be superior to other approaches in terms of value clarification. That is, all the treatments have been validated in terms of value clarification. Therefore, in the present study also value clarification was selected as one of the dependent variable.

Self-direction of classroom activities, active participation, and teacher rapport increased by using Value Clarification Strategies (Hammond, Wenker-Konner and Egner, 1973; Covault, 1973; and Guzaik, 1974), and Value Clarification Experience (Bramson, 1985). Thus classroom climate was taken as dependent variable.

Covault (1973), Guzaik (1974), and Wenker-Konner, Hammond, and Egner (1973) using value clarification strategies found a significant improvement in self-concept of students, while Gray (1975) observed no significant change in self-concept. Under such circumstances it was thought to see the effect of treatment on self-concept. Therefore, self-concept was selected as dependent variable.

In almost all approaches of value clarification, students work in a group. They interact and exchange their views among themselves. Students get chance to listen and broaden their vision. Under such circumstances, the value judgment, social and educational adjustment and self-acceptance are more appropriate variables which need to be studied in the course of the treatment.

From the above-mentioned researches it can be observed that most of the studies have been conducted abroad and two studies in this area have been conducted in India. At college level very few studies (Raduns, 1973; Kaufman, 1974, Dodge, 1983; Kinner, 1983; and Otis, 1983) have been conducted. Further, from the available treatments, Value Discussion Model was developed and tried out in India. So, it was thought to take up Value Discussion

Model as a treatment. Further, since most of the studies have been conducted at school stage but a few at college stage, so the college level was selected. Keeping in mind the potency of developing value clarification through Value Discussion Model and absence of studies in India, the present investigation was undertaken.

### **Statement of the Problem**

The statement of the problem was as follows:

Comparative Effectiveness of Value Discussion Model with Traditional Approach for Developing Value Clarification of College Students.

### **Objectives**

The objectives of the study were:

- To study the effectiveness of Value Discussion Model in terms of Value Clarification and Reaction towards Value Discussion Model.
- To study the change in respect of Value Clarification, Value Judgment, Self-concept, Self-acceptance, Social Adjustment, Educational Adjustment, Classroom Climate and Reaction towards Value Discussion Model of students treated through Value Discussion Model.
- To compare Value Discussion Model with Traditional Approach in terms of Value Clarification, Value Judgment, Self-concept, Self-acceptance, Social Adjustment, Educational Adjustment and Classroom Climate separately by considering intelligence as covariate.

### **Sample**

The present study was experimental in nature and it was conducted in two stages — tryout and field. At tryout stage, the tools were developed. For developing the tools a sample was used. At field stage, experiment was conducted on a different sample. But the samples used at tryout and field stages belonged to the same population. Details in respect of samples used at tryout and field stages are given below.

#### *Sample for Tryout Stage*

In Indore there were 12 colleges. Of these four colleges were selected at random. Further, from these colleges, the subjects were selected through random sampling method. The sample at this stage comprised of 233 students of B.A. Ist year studying in Government Arts and Commerce College,

Government Science College, Holker Science College and Old Girls Degree College. All these colleges are situated in Indore and affiliated to Devi Ahilya Vishwavidyalaya, Indore. Out of 233, 117 students were from Government Arts and Commerce College, 29 from Government Science College, 23 from Holker Science College, and 64 from Old Girls Degree College. All these colleges are from the city of Indore. Further out of 233, there were 84 arts, 52 science, 57 commerce and 40 home science students. The sex composition in the sample was 130 male and 103 female students. All students were from urban area. Their age ranged from 17 to 19 years. The medium of instruction in all colleges was Hindi and a unified syllabus was followed in first year in all colleges affiliated to different universities situated in Madhya Pradesh.

### *Sample for Field Stage*

For the purpose of experimentation, one college situated in Indore was selected. This was Old Girls' Degree College, Indore. In this college, there were four sections of B.A. 1st year and four of B.Sc. 1st year. Out of four sections of B.A. 1st year, two sections were selected randomly. Similarly out of four sections of B.Sc. 1st year, two sections were selected randomly. Therefore, four sections were randomly selected for the purpose of experimentation. Further, out of these four sections, one arts and one science sections were randomly assigned the treatment and thus called experimental group. On the other hand, the remaining two sections continued with traditional procedure and thus called control group. In all, there were two experimental and two control groups. The size of sample for field stage was 127. Of these, 63 subjects (32 arts and 31 science) were in the experimental group while 64 subjects (34 arts and 30 science) in control group. All subjects were female. They represented different socio-economic status. All subjects were from urban area. Majority of them were day scholars. Their age ranged from 17 to 19 years. The medium of instruction both in arts and science disciplines was Hindi. In first year the unified syllabus was followed in all the universities of Madhya Pradesh.

### **Design**

The present study was experimental in nature. The study was designed on the basis of Non-Equivalent Control Group Design. There were two groups, one designated as experimental group and the other control group. The students in both the groups were as existed in the field. It was only the sections which were randomly selected but not the subjects within each section. Both the groups were pretested by administering Value Clarification Scale, Value

Judgment Test, Self-acceptance Inventory, Self-concept List, Educational and Social Adjustment Inventory and Classroom Climate Scale. The experimental group was taught the paper, viz. "The Cultural Heritage of India" through Value Discussion Model. The Cultural Heritage of India was a compulsory paper for all students of arts, science, commerce and home science. The various topics taught from this paper were: The People of India: Ethnic, Religious, Linguistic and Cultural Fabric; India's Tribal Heritage; The Great Religion — Philosophical Traditions in India; Freedom Movement in India; and India's Encounter with the Wider World. The dilemmas were related to each of the selected topics. For each topic, there were more than one dilemma. Each day one dilemma was used in the experimental group and continued for a period of one hour. The total treatment duration was 30 working days spread over three months. On the other hand, in the control group the same topics were taught through the traditional approach but at appropriate places during the teaching the dilemma related to the topic was stated in the classroom and it was left up to the students for discussion and drawing conclusion(s). At the end of the treatment, both the groups were post-tested with the help of tools which were used for pretesting. The experimental group was administered a reaction scale towards Value Discussion Model after 10 days of treatment and at posttesting stage. The extraneous variable like Intelligence was assessed before the treatment and considered as covariate.

### Tools

The following tools were used in order to collect the data.

(a) *Value Clarification Scale*: Value Clarification Scale was developed by Investigator. There were 50 items in the scale. The test-retest reliability was found to be 0.76. The score ranged from 50 to 250.

(b) *Value Judgement Test*: Value Judgement Test was developed by Investigator. There were 20 items in the test. The test-retest reliability was found to be 0.86. The score ranged from 20 to 80.

(c) *Reaction Scale towards Value Discussion Model*: Reaction was developed by Investigator. There were 30 items in the scale. The score ranged from 30 to 150.

(d) *Word Personality List*: This test was developed by Pratibha Deo. The test-retest reliability was found to be 0.89.

(e) *Self-acceptance Inventory*: This inventory was developed by Kakkar. It consisted of 34 items. The test-retest reliability was found to be 0.94. The score ranged from 0 to 34.

(f) *Adjustment Inventory for College Students*: This inventory was developed by Sinha and Singh. There were 40 items in the test (only two



dimensions were selected for this study, i.e. social and educational). The test-retest reliability was found to be 0.97.

(g) *Classroom Climate Scale*: This scale was developed by Maria. The test-retest reliability was found to be 0.94. The score ranged from 0 to 200.

(h) *Culture Fair Intelligence Test Scale*: This test was developed by Cattell. It was a non-verbal test. The test-retest reliability was found to be 0.94. The score ranged from 0 to 50.

### **Procedure for Data Collection**

A group of 127 college students, as mentioned under sample was taken for experiment. Out of 127 students, 63 were in experimental group and remaining 64 in control group. First, all the students were administered Culture Fair Intelligence Test (Scale-3) developed by Cattell in order to measure Intelligence. This test was administered to both experimental and control groups. After this, Value Clarification Scale, Value Judgement Test, Self-acceptance Inventory, Self-concept List, Social and Educational Adjustment Inventory, and Classroom Climate Scale were administered on six consecutive days. On the other hand, on same days same tools were administered to control group. After this, experimental group was treated through Value Discussion Model by taking dilemmas involving value conflicts. The dilemmas were taken from their course entitled "The Cultural Heritage of India". Lessons were presented according to the phases of Value Discussion Model. First, the dilemma was presented. After this students were asked to take their position about what action he or she thinks the central character should take. At third phase students were engaged in small group discussion about the reasoning used to justify the actions they recommended. In the same phase, they were told to write at least two reasons for their stance. At fourth phase, a class discussion was conducted in which students gave reasons for the positions they had taken. The students of other sub-groups of experimental group reacted to the positions taken by the group. In this way sub-groups got opportunity to challenge the position taken by the sub-group. Various probe questions were asked by the teacher. At final phase students were asked to write one most powerful reason for their stance. Likewise all 30 lessons were presented to the experimental group. After 10th lesson experimental group was administered a Reaction Scale for assessing their reaction towards Value Discussion Model. The treatment continued for 30 working days at the rate of one hour per day spread over three months. On the other hand, the control group was taught the same content through traditional approach and same dilemmas were presented where it was necessary and left up to the students for discussion and thinking. At the end

of the treatment, dependent variables were measured by administering Value Clarification Scale, Value Judgment Test, Self-acceptance Inventory, Self-concept List, Social and Educational Adjustment Inventory and Classroom Climate Scale to both the experimental and control groups. The Reaction Scale was administered only to the experimental group at the end of the treatment.

### Statistical Techniques

1. In order to study the effectiveness of Value Discussion Model in terms of Value Clarification and Reaction towards Value Discussion Model, the data related to the value clarification were analyzed using correlated t-test and Reaction Scale data were analyzed by computing mean, SD and coefficient of variance.
2. In order to study the change in respect of Value Judgment, Self-concept, Self-acceptance, Social Adjustment, Educational Adjustment, Classroom Climate and Reaction towards Value Discussion Model, the data were analyzed by using correlated t-test.
3. In order to compare the mean Value Clarification, Value Judgment, Self-concept, Self-acceptance, Social Adjustment, Educational Adjustment and Classroom Climate separately of experimental group with that of control group by taking intelligence as covariate, the data were analyzed with the help of analysis of covariance

### Results

The results are given in the following tables.

#### *Effectiveness of Value Discussion Model in terms of Value Clarification*

TABLE 1  
Mean, SD, r, and t-value for Value Clarification

Test	N	Mean	SD	r	t-test
Pie-test	60	178.42	15.65	0.33	3.38*
Post-test	60	190.90	16.11		

*Effectiveness of Value Discussion Model  
in terms of Reaction towards Model*

TABLE 2  
Mean, SD, and Coefficient of Variation for Reaction

Group	Mean	SD	CV
Experimental	126.05	11.29	8.96%

*Change in respect of Value Judgement*

TABLE 3  
Mean, SD, r, and t-value for Value Judgement

Test	N	Mean	SD	r	t-test
Pre-test	60	52.06	5.68	0.93	6.98*
Post-test	60	54.35	6.02		

*Change in respect of Self-concept*

TABLE 4  
Mean, SD, r, and t-value for Self-concept

Test	N	Mean	SD	r	t-test
Pre-test	60	103.34	10.23	0.84	8.41*
Post-test	60	114.03	11.31		

*Change in respect of Self-acceptance*

TABLE 5  
Mean, SD, r, and t-value for Self-acceptance

Test	N	Mean	SD	r	t-test
Pre-test	60	24.84	2.31	0.46	5.51*
Post-test	60	27.80	3.04		

*Change in respect of Social Adjustment*

TABLE 6  
Mean, SD, r, and t-value for Social Adjustment

Test	N	Mean	SD	r	t-test
Pre-test	60	14.24	1.67	0.46	8.77*
Post-test	60	16.24	1.59		

*Change in respect of Educational Adjustment*

TABLE 7  
Mean, SD, r, and t-value for Educational Adjustment

Test	N	Mean	SD	r	t-test
Pre-test	60	15.45	1.76	0.79	9.39*
Post-test	60	17.35	1.42		

*Change in respect of Classroom Climate*

TABLE 8  
Mean, SD, r, and t-value for Classroom Climate

Test	N	Mean	SD	r	t-test
Pre-test	60	155.81	12.62	0.31	2.15*
Post-test	60	160.37	13.69		

*Change in respect of Reaction towards VDM*

TABLE 9  
Mean, SD, r, and t-value for Value Clarification

Test	N	Mean	SD	r	t-test
Pre-test	60	119.80	10.09	0.89	8.44*
Post-test	60	126.05	11.29		

*Comparison of VDM with Traditional Approach  
in Terms of Value Clarification*

TABLE 10  
Summary of ANCOVA for Value Clarification by taking  
Intelligence as Covariate

Source of Variance	df	SSy.x	MSSy.x	Fy.x
Among	1	3203.89	3203.89	78.76
Within	118	4809.47	40.76	
Total	119			

*Comparison of VDM with Traditional Approach  
in Terms of Value Judgement*

TABLE 11  
Summary of ANCOVA for Value Judgement by taking  
Intelligence as Covariate

Source of Variance	df	SSy.x	MSSy.x	Fy.x
Among	1	32.07	32.07	10.69*
Within	118	354.24	3.002	
Total	119			

*Comparison of VDM with Traditional Approach  
in Terms of Self-concept*

TABLE 12  
Summary of ANCOVA for Self-concept by taking  
Intelligence as Covariate

Source of Variance	df	SSy.x	MSSy.x	Fy.x
Among	1	2746.38	2746.38	49.03*
Within	118	6609.55	56.01	
Total	119			

*Comparison of VDM with Traditional Approach  
in Terms of Self-acceptance*

TABLE 13  
Summary of ANCOVA for Self-acceptance by taking  
Intelligence as Covariate

Source of Variance	df	SSy.x	MSSy.x	Fy.x
Among	1	192.04	192.04	40.03*
Within	118	566.09	4.79	
Total	119			

*Comparison of VDM with Traditional Approach  
in Terms of Social Adjustment*

TABLE 14  
Summary of ANCOVA for Social Adjustment by taking  
Intelligence as Covariate

Source of Variance	df	SSy.x	MSSy.x	Fy.x
Among	1	19.64	19.64	6.70*
Within	118	345.93	2.93	
Total	119			

*Comparison of VDM with Traditional Approach  
in Terms of Educational Adjustment*

TABLE 15  
Summary of ANCOVA for Educational Adjustment by taking  
Intelligence as Covariate

Source of Variance	df	SSy.x	MSSy.x	Fy.x
Among	1	85.07	85.07	48.37*
Within	118	267.52	1.75	
Total	119			

*Comparison of VDM with Traditional Approach  
in Terms of Classroom Climate*

TABLE 16  
Summary of ANCOVA for Classroom Climate by taking  
Intelligence as Covariate

Source of Variance	df	SS <sub>y.x</sub>	MSS <sub>y.x</sub>	F <sub>y.x</sub>
Among	1	753.66	753.66	32.36*
Within	118	2748.02	23.29	
Total	119			

\* Significant at 0.01 level

### Findings

The following are the findings of the present study.

Value Discussion Model was found to be effective in terms of Value Clarification (See Table 1).

Value Discussion Model was found to be effective in terms of Reaction towards Value Discussion Model (See Table 2).

There was a significant change in Value Clarification of students treated through Value Discussion Model (See Table 1).

There was a significant change in Value Judgment of students treated through Value Discussion Model (See Table 3).

There was a significant change in overall Self-concept of students treated through Value Discussion Model (See Table 4).

There was a significant change in Self-acceptance of students treated through Value Discussion Model (See Table 5).

There was a significant change in Social Adjustment of students treated through Value Discussion Model (See Table 6).

There was a significant change in Educational Adjustment of students treated through Value Discussion Model (See Table 7).

There was a significant change in Classroom Climate of students treated through Value Discussion Model (See Table 8).

There was a significant change in Reaction towards Value Discussion Model of students treated through Value Discussion Model (See Table 9).

The Value Discussion Model was found to be superior to Traditional Approach in terms of Value Clarification when intelligence was taken as covariate (See Table 10).

The Value Discussion Model was found to be superior to Traditional Approach in terms of Value Judgment when intelligence was taken as covariate (See Table 11).

The Value Discussion Model was found to be superior to Traditional Approach in terms of Self-concept when intelligence was taken as covariate (See Table 12).

The Value Discussion Model was found to be superior to Traditional Approach in terms of Self-acceptance when intelligence was taken as covariate (See Table 13).

The Value Discussion Model was found to be superior to Traditional Approach in terms of Social Adjustment when intelligence was taken as covariate (See Table 14).

The Value Discussion Model was found to be superior to Traditional Approach in terms of Educational Adjustment when intelligence was taken as covariate (See Table 15).

The Value Discussion Model was found to be superior to Traditional Approach in terms of Classroom Climate when intelligence was taken as covariate (See Table 16).

### **Implications**

The findings of the present study have implications for teacher educators, students, teachers, administrators, and book writers. Each one of them has been spelt out in this caption.

#### ***Teacher Educators***

As pointed out by the Education Commission (1964-65) that the destiny of a nation is being shaped in her classrooms, meaning thereby that the total development of the students, to a large extent, is in the hands of teachers. These days people are not very satisfied with the type of development taking place in classrooms. The values are on the decline. The students seem to have a particular value without having proper understanding of it. That means students are not in a position to clarify their positions with respect to value(s) held by them. There may be several reasons for such a state of affair. Some of the reasons might be that the teachers have never tried to develop these abilities which help the students in Value Clarification. This may be, further,



due to the fact that the teachers never got training in various strategies/models of Value Clarification. There is a lack of literature in this area. So far very little efforts have been made even by the researchers. If researchers would have worked then some procedures would have been known. Now, the present study has shown that Value Clarification can be developed with the help of Value Discussion Model. This model has been explained in simple language. Not only this but 30 exercises and lesson plans are available. This material can be used by the teacher educators of Academic Staff Colleges as well as Teacher Training Institutions. If Value Discussion Model is implemented in these institutions then it will develop competency in the use of Value Discussion Model. Therefore, it will be easy to use Value Discussion Model in the classes. Not only this, but this research, to some extent, has demonstrated that the subject matter which is more conducive to this model can be taught. Therefore, the findings of the present study has strong implications for teacher educators of both Academic Staff Colleges and Teacher Training Institutions.

### *Students*

This is the age of technology and its use has changed the society. There is a lot of awareness among people residing both in rural as well as urban areas. People feel responsible for their own growth and development. Students cannot remain uninfluenced. These days students have to share the responsibilities of their growth and development. If they are not watchful, no one can help in this fast changing world and society. Students are ready to work hard provided some help or guidance is available. They feel that they are weak in justifying their position. This may be due to lack of opportunity for exchanging their views. In Value Discussion Model, opportunity for discussion was provided to college students for 30 working days and the results revealed that students had benefited from such an exercise. Discussion as a method of teaching is available but it is hardly used in the classroom. There may be reasons for not using discussion as a method in the regular teaching. But students keep on discussing political affairs among themselves. They can do more carefully utilizing the guidance from Value Discussion Model. The whole instructional material in the form of lesson plans may be used by students either in the college or outside the college.

### *Teachers*

Today it is felt that values are on decline. Teachers also talk about it but are unable to do anything. The reasons might be: the teachers teaching at the college level, generally do not have any formal training, practically no workshop or seminar is organized where some exposure can take place and

there is a lack of literature in this area. The teachers, mostly, learn the techniques or skills of teaching during the process of teaching. Secondly, some of them might adopt their own teaching style. All these are content-dominated and try to help students to pass the examination. Teachers may not easily adopt a method which does not help them to achieve the above-mentioned objectives. In almost every research study in which Value Clarification Approach was used, it was found that the Value Clarification Group did as well as or better than the other groups on measures of knowledge and skill in the particular subject areas (Kirschenbaum, 1972). Thus, teachers can be assured of attaining the objective of teaching through teaching matter through the use of a Value Clarification Strategy. If it is done, then there will be an additional advantage of developing Value Clarification which was not done before. The present study has made the implementation of Value Discussion Model—a Value Clarification Strategy—easy by way of providing the instructional material in the form of lesson plans. All these are from the real curriculum being followed in the various universities of Madhya Pradesh. Further, teachers after seeing the lesson plans can develop their own exercises from their discipline. Thus, in this way the Value Discussion Model can be implemented in the colleges by the teachers of different disciplines.

### *Administrators*

The findings of the Value Discussion Model are quite encouraging. It not only helps in the development of the Value Clarification but also helps in the improvement of Social Adjustment, Educational Adjustment, Self-concept, Self-acceptance and Classroom Climate. It indicates that the Value Discussion Model is quite beneficial. Keeping in mind the benefits of Value Discussion Model, its use in the classroom necessarily needs support of administrators. Therefore, there are implications of this study to the administrators. The use of Value Discussion Model requires training of teachers, instructional materials, flexibility in the time table, freedom to change the setting of the classroom and allowing others to tolerate the noise which may be during the process of discussion. The administrator can alone help in the implementation of Value Discussion Model by way of motivating teachers and providing maximum possible help in the above-mentioned areas.

### *Book Writers*

Books are the important source of information. Not only this but they are the best companions. The books are instrumental in changing and moulding the personality of human beings. Due to the technological advancements, there has been drastic changes in the ways and means of writing books. The present

study has given an innovative idea which may be easily incorporated in the books by the writers. The writers at appropriate places can incorporate dilemmas and even argumentations so that the readers are influenced and some significant changes may be observed in the readers. The writers having language facility can easily accommodate various phases of Value Discussion Model in their writings. Thus, the findings of present study have implications for book writers too.

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## ***Research Notes***

# **Relationship between the Needs of Various Levels of Maslow's Hierarchy**

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MASLOW (1970) has presented the concept of hierarchy of needs, which means that lower order need must be satisfied in order to enable one to function at one step higher need. Need-affiliation belongs to the third level in Maslow's hierarchy which Maslow calls love and belongingness needs. Need-achievement and need-dominance are the fourth in Maslow's hierarchical structure of needs, which Maslow terms as self-esteem needs. The self-actualization needs according to Maslow constitute the fifth level in the need hierarchy. Need endurance and needs nurturance in the present study are treated as the self-actualization needs. Self-actualizers according to Maslow are guided by values such as truth, justice, and beauty. Maslow also found them to possess a desire to help the humanity. It can be clearly seen that the pursuit of these values requires patient and sustaining attitude and action. Such persons may therefore be assumed to have high need endurance and high need-nurturance.

Maslow observed self-transcendence and mystic experiences as characteristics found in the self-actualized personalities. Frankl (1966) views spirituality and related phenomenon like self-transcendence as separate from self-actualization. For Frankl (1966) self-transcendence is distinctly a human phenomenon and it is derived not from the fulfilment of organismic potential but from man's consciousness in relation with the world and his ability to find purpose beyond himself. Pleasure, happiness, joy, and "actualization of the self" are seen by Frankl (1969) as side effects on unintentional followings from the intentionality of life in the attaining of meaning. These unintentional effects cannot be directly sought as this "self-seeking" violates man's essential

directedness to the world. Frankl emphasizes that it is the world which is experienced with joy, pleasure and the other "emotional states" which Maslow sees as end experiences. To concentrate on the expression of a real self, Frankl (1967) notes, creates a state of "hyperintention" on the self which blocks the possibility of what is sought (self-fulfilment). "Self-actualization", if made an end in itself, contradicts the self-transcendent quality of human existence. Like happiness, self-actualization is an effect, the effect of "meaning fulfilment". In sum, only to the extent that man fulfils a meaning in the world, does he fulfil himself.

Elkins *et al.* (1988) defined spirituality as, "spirituality which comes from the Latin *spiritus*, meaning "breath of life, is a way of being and experiencing that comes about through awareness of transcendental dimension and that is characterized by certain identifiable values in regard to self, others, nature, life and whatever one considers to be the ultimate".

The nine components of spirituality arrived by Elkins *et al.* (1988) are as follows.

### *1. Transcendent Dimension*

The spiritual person has an experientially based belief that there is a transcendent dimension to life. The spiritual person is one who has experienced the transcendent dimension, often through what Maslow referred to as "peak experience", and he or she draws personal power through contact with this dimension.

### *2. Meaning and Purpose in Life*

The spiritual person has known the quest for meaning and purpose and has emerged from this quest confident that life is deeply meaningful, and that one's own existence has purpose.

### *3. Mission in Life*

The spiritual person is "metamotivated".

### *4. Sacredness of Life*

The spiritual person believes that life is infused with sacredness and often experiences a sense of awe, reverence, and wonder even in "non religious" settings.

### *5. Material Values*

The spiritual person knows that "ontological thirst" can only be quenched by



the spiritual and that ultimate satisfaction is found not in materials but spiritual things.

#### 6. *Altruism*

He or she has a strong sense of social justice and is committed to altruistic love

#### 7. *Idealism*

The spiritual person is a visionary committed to the betterment of the world.

#### 8. *Awareness of the Tragic*

The spiritual person is solemnly conscious of the tragic realities of human existence. He or she is deeply aware of human pain, suffering and death.

#### 9. *Fruits of Spirituality*

The spiritual person is one whose spirituality has borne fruits in his or her life.

Mathes and Edwards (1978) tested the hierarchical aspect of Maslow's theory of motivation. The results of their study suggest that Maslow's hierarchical theory of motivation should be modified to include only two or three levels. Security was shown to be a pre-requisite to self-actualization, while belongingness and esteem were shown not to be essential pre-requisites.

Taking into consideration Maslow's theory of Hierarchy of Needs, the objective of the study was to explore the functioning of certain needs in relation to other needs. The six needs studied were: need-affiliation (love and belongingness needs), needs-achievement and needs-dominance (self-esteem needs), needs-endurance and needs-nurturance (self-actualization needs), and spirituality (self-transcendence need).

It was hypothesised that subjects scoring above the mean on one of these measure of need would obtain significantly higher average scores on all the measures of need, further up the hierarchy, than subjects scoring below the mean, e.g. high scorer subjects on love and belongingness need (n-aff.) would obtain significantly higher average on self-esteem and self-actualization needs than subjects who are low scorers on affiliation need. Achievement and dominance are considered under self-esteem needs, endurance and nurturance are considered as self-actualization need and spirituality as self-transcendence need.

## **Methology**

### *Sample*

The sample consisted of two hundred and twenty teachers (lecturers, readers and professors) of the various faculties of the Aligarh Muslim University (A.M.U.). The total number of teachers in A.M.U. according to a recent list of teaching staff is eleven hundred and fifty. The subjects were picked up randomly. Every third subject from the list was contacted and requested to participate in the research. Those who showed willingness were selected. In the final selection, 220 subjects responded to the questionnaires. The age of the subjects varied from 24-60 years. The sample is expected to be matched with education and to socio-economic status. On the whole the sample is representative of the teaching staff population of A.M.U.

### *Spiritual Orientation of Inventory (Elkins et al. 1988)*

There are 85 items in it. The nine subscales of the Spiritual Orientation Inventory are based on nine dimensions of spirituality discussed earlier. Elkins conducted a thorough alpha reliability study and reported alpha values which ranged from .81 to .98 for the nine scales.

Since the test is being used for first time in India, the author first obtained the reliability and validity on 50 subjects. The reliability was calculated by the Kuder Richardson method for the nine dimensions of spirituality. The coefficients ranged from .75 to .091. Validity was determined by the external criteria method. The test was validated against Wuthnow's test (1978) regarding the incidence of peak experience. The test was found to be valid by calculating chi-square.

### *Need Measure. Meenakshi Personality Inventory (Bhatnagar, 1979)*

Meenakshi Personality Inventory is a modified version of *EPPS* in Hindi based on only ten needs. The ten needs are as follows: Abasement, Achievement, Affiliation, Aggression, Autonomy, Dominance, Exhibition, Nurturance, Succourance, Endurance. It is a reliable and valid measure of needs.

First of all, the subjects were divided into high and low groups on the basis of their score on need affiliation. Those subjects who had scored above Mean were called high scorers and those below Mean were called low scorers. The score of high affiliation for self esteem and self actualization and self-transcendence needs were found out. Similarly the Mean score on these three Hierarchy of Needs were found out of the subjects having low affiliation score. (Affiliation is treated here as under love and belongingness needs.) The difference between the two groups of subjects was ascertained for its significance through t-test.

On the second level, the subjects were divided into high and low in need achievement (self-esteem need) and their mean score on self-actualization and self-transcendence needs were compared. Similarly, subjects were divided into high and low in need dominance (self-esteem need) and their mean score on self-actualization and self-transcendence needs were compared.

On the third level of the present study, subjects were divided into high and low in terms of their need endurance score and their mean scores on spirituality (self-transcendence) were compared. Similarly, subjects were divided into high and low nurturants and their mean score on spirituality was compared.

Multiple regression analysis was also carried out for predicting higher needs on the basis of lower needs.

### Results and Discussion

The results (Table 1) show that high and low affiliation subjects significantly differed in terms of their mean achievement scores. However, low affiliation Ss scored higher on n-achievement than high affiliation Ss.

High achievement Ss have significantly higher n-endurance score than low achievement Ss. Similarly high achievement Ss have significantly higher score on spirituality. (The results of spirituality are based on total spirituality score without taking into consideration the dimensions of spirituality separately). High n-dominance subjects scored significantly less on both n-endurance, and n-nurturance than low dominance Ss. High nurturant Ss scored significantly higher on spirituality than low nurturant Ss.

A number of studies have shown that satisfaction of physiological (Cofer and Appley, 1964) Security (Maslow, Birsh, Honigman, McGrath, Plason and Stein 1952), belongingness (Rogers and Dymonds, 1954) and esteemed needs (Maslow, 1939, 1940) facilitates self-actualization, there is no evidence demonstrating that these lower needs form the hierarchy specified by Maslow.

The multiple regression analysis for predicting higher needs on the basis of lower needs (Table 2) revealed that need affiliation does not predict need achievement and need-dominance. Need affiliation as a predictor of need endurance, fails to predict need endurance. The regression coefficient shows a negative direction and the F-values is 1.38 which is not significant. However, need affiliation predicts need nurturance. The regression coefficient is .125 with an R value of .125. The F value obtained is 3.48 which is significant at .05 level. Need affiliation as a predictor of spirituality reveals an F-value of 1.02 which is not significant.

# VARIOUS LEVELS OF MASLOW'S HIERARCHY

TABLE 1

## Mean Scores on Higher Needs of High and Low Scorers on Lower Needs

	<i>High Affiliation Mean</i>	<i>Ss</i>	<i>Low Affiliation Mean</i>	<i>Ss</i>	<i>t</i>
Achievement (Self Esteem Needs)	3.16	2.39	4.11	2.53	2.74**
Dominance	7.22	2.54	7.55	2.63	0.95
Endurance	12.47	2.62	11.83	2.76	1.67
(Self-actualization Needs)					
Nurturance	12.27	2.39	10.27	2.58	2.69**
Spiritual	403.25	61.69	387.55	73.17	1.67
(Self-transcendence Needs)					
	<i>High Achievement Mean</i>	<i>Ss</i>	<i>Low Achievement Mean</i>	<i>Ss</i>	<i>t</i>
Endurance (Self-actualization)	12.36	2.46	11.65	3.01	1.90*
Nurturance	10.30	2.92	10.32	3.28	0.05
Spirituality (Self-transcendence)	397.20	68.71	349.50	139.52	3.17**
	<i>High Dominance Mean</i>	<i>Ss</i>	<i>Low Dominance Mean</i>	<i>Ss</i>	<i>t</i>
Endurance (Self-actualization)	11.74	2.75	12.55	2.54	2.20*
Nurturance	9.63	3.02	10.68	2.97	2.49*
Spirituality (Self-transcendence)	392.79	67.21	380.85	107.78	0.96
	<i>High Endurance Mean</i>	<i>Ss</i>	<i>Low Endurance Mean</i>	<i>Ss</i>	<i>t</i>
Spirituality (Self-transcendence)	418.11	51.71	382.42	61.37	1.60
	<i>High Nurturance Mean</i>	<i>Ss</i>	<i>Low Nurturance Mean</i>	<i>Ss</i>	<i>t</i>
Spirituality (Self-transcendence)	405.12	71.97	365.53	107.31	3.11**

\* Significant at .05 level \*\* Significant at .01 level

Need achievement and dominance which are the self-esteem needs used as predictors of self-endurance and need-nurturance, which are a step higher than self-esteemed needs. In this case IV's (achievement and dominance) for the prediction of need endurance yield multiple R of .187 with an F-value of 3.94 which is significant (above .02 level). Need achievement has a positive

TABLE 2

Multiple Regression Coefficient for Predicting Higher Needs on the Basis of Lower Needs

IVS (Independent variable)	Achievement			Dominance			Endurance			Nurturance			Spirituality		
	r	R	F	r	R	F	r	R	F	r	R	F	r	R	F
Affiliation Lower: Belong- iness needs	-.07	.066	.962	-.03	.027	.168	-.08	.0797	1.388	.13	.1257	3.488	.07	.0685	1.02
Achievement Dominance (Self-esteem needs)							.08	1.87	3.94	.13	.2037	4.675**	-.08	.0795	.687
							-.17			-.17			.007		
Endurance													.11	.1589	2.83*
Nurturance (Self-actuali- zation needs)													.14		

\*\* = Significant > .02 < .01 level

\* = Significant > .06 < .05 level

r = product moment correlation

R = Multiple Regression

F = based analysis of variance

## VARIOUS LEVELS OF MASLOW'S HIERARCHY

relationship with need endurance or contributes positively to need endurance. The regression coefficient of need dominance is much larger than the regression coefficient of need achievement meaning thereby that n-dominance contributes much more though negatively to need endurance. The IV's achievement and dominance for the prediction of need nurturance reveals an F-value of 4.67 which is significant at .01 level. Need achievement contributes positively to need nurturance, while need dominance contributes negatively to need nurturance meaning thereby, that low dominant individuals would have more need nurturance. The contributions of these self-esteem needs to spirituality is not significant. ( $F = .68$ ).

Need endurance and need nurturance which are self-actualization needs as predictors of spirituality revealed F-value of 2.80 which is significant at .06 level but not at the accepted .05 level. It can be seen that both needs yield positive coefficients.

We do not have a measure of need satisfaction: all that is measured is the presence of a need which shows the individual's functioning at the level of that particular need. Therefore, we cannot say anything definite about the hierarchical structure of needs. However, something can be deduced about the relationship among the various levels of needs on the basis of t-test. Subjects high on need achievement have higher score on need-endurance and need-nurturance. Thus it can be argued that this self-esteem need is associated to the self-actualization need. Need dominance, probably is not a self-esteem need in the sense need achievement is. It is more a power-oriented need, and high scoring subjects on this need are low in self-actualization.

Self-actualization needs (both endurance and nurturance) are associated to self-transcendence (spirituality) in the predicted manner. Thus, we can conclude that Maslow's hierarchical structure of needs seems to be true in case of certain needs. Certain self-esteem needs may lead to self-actualization and self-actualization may in turn lead to self-transcendence.

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# **Influence of Recent Life Experience on Mental Health of School Teachers**

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Social scientists have frequently voiced the opinion that social environment plays a significant role in the causation development of mental illness. The occurrence of mental illness depends on sex, age and condition of life work. Females have been found to be more frequently affected by mental illness as compared to their male counterparts (Chesler, 1972; Redloff, 1975; Carstairs & Kapur, 1976; Hannary, 1979; Penfold, 1981; Mishra & Sharma, 1982; Shirali & Kanwar, 1980). Several studies have shown that life stress have been related to neurotic impairment (Theorall, 1961) and to psychosomatic illness (Dohrenwend and Dohrenwend, 1978). Vyas and Bhardwaj (1972) and Bacherikov Karchenko (1978) have pointed out that higher occurrence of neuroticism is found in the females of 16-25 age-group. Studying life events and mental health in urban population, Langner and Michael (1963) found that female subjects are affected more by life events. Unlenhuth and Paykel (1973) reported a strong relationship between life stress and mental disorders in female subjects. In the light of above-mentioned studies the present study intends to investigate the impact of life events on mental health of male and female teachers.

## **Sample**

Eighty male and female school teachers working in the schools at Srinagar (Garhwal) were selected for this study.

## **Tools**

The following tools were used for the purpose of this study.

### *Langner-Paliwal Scale for Measuring Mental Health*

This scale is the Hindi version of Langner's 22 item screening instrument. This instrument was developed to enable detection of mental illness of the people.



Each item in the scale is a statement of question regarding the presence of either a psychological or a somatic symptom. The respondent is required to indicate whether or not the items applies to him. This scale by no means, covers the whole range of psychopathology. It would probably fail to identify persons with organic brain damage, the mentally retarded, and sociopaths. However, it provides a rough indication of where people lie on a continuum of impairment in life functioning due to very common type psychiatric symptoms.

Sellier (1973) effectively criticises the uses of Langner scale as a measure of mental illness. However he considers it as a measure of "psychological stresses" and "physical malaise" in the respondent. He cites a body of finding which seems to substantiate its use as a measure of psycho-physiological strain in the respondent, which is an indicator of coping struggle occurring within the individual, rather than as a measure of psycho-physiological strain. Sellier's commentary suggests that Langner scale should be viewed as a measure of situational strain in the respondent, which is an indicator of coping struggle occurring within the individual, rather than a measure of chronic psychiatric impairment. Since strain is a close and an efficient predictor of health breakdown due to psycho-somatic causes. It was considered worthwhile to use it for the purpose. In a sense the strain measure amalgamates the effects of life changing events, and the capacities of the individual to deal with challenger. In fact strain is the syndrome which in most psycho-somatic models is a close pathogenic antecedent of illness.

### *Scoring Systems*

In all there are 22 items in the Langner's scale. Each item is followed by four or five alternative responses, for example, 'Yes', 'No', 'DK' and 'NA' or 'Often', 'Sometimes', 'Never', 'DK' and 'NA'. The response 'Yes' and 'Often' are pathogenic and are considered as positive ones. The positive responses are given 2 score each. The positive responses are summed up and the magnitude at the score becomes the basis of judgement about mental impairment.

### *Paliwal Recent Life Events Questionnaire*

This instrument is very similar to the schedule of Recent Life Experience of Holmes and Rahe (1967). The instrument used by Anderson's modification of Schedule of Recent Experience for use in college populations (Anderson, (1972). This 47-item instrument assumes that each life change event constitute a demand upon the body for adaptation and that the magnitude of that demand is reliable quantified by weightings developed in prior studies by consensus ratings. Respondents are required to record the number of

occasions in the previous 12 months on which the event occurred. This number is then multiplied by the adjustment weightings for each event and finally, these estimates are added to yield an over-all change score for each respondent.

### Procedure

The individual interview method was used for data collection. The subjects were assured that responses will be kept confidential and will be used for research purpose only.

### Results

The data were analyzed with the help of statistical techniques. Consequently, mean, standard deviation, correlation, 't' value and value-loadings were calculated.

#### *Psycho-physical Strain*

Table 1 shows mean, S.D. and correlation between psycho-physical strain and recent life experiences. It was found that these two variables are positively correlated. Higher the score on recent life experiences ( $M=7.837$ ,  $r=8.8$ ) leads to the psycho-physical strain ( $M=4.5757$ ,  $r=2.48$ ). Table 2 shows that male teachers differ significantly on psycho-physical strain ( $t=15.535$ ,  $7.01$ ). Male teachers ( $M=6.6$ ,  $r=5.60$ ) are more influenced than female teachers ( $M=2.53$ ,  $r=2.53$ ).

Table 3 shows that item 22 carries the highest value loadings which could be interpreted to mean that 78 per cent of the respondents consider the futility of everything and wonder anything worthwhile; 66 per cent get hot all over; 62 per cent of them are worrying type; 60 per cent feel weak all over; 58 per cent feel that nothing ever turns outright for them. As many as 38 per cent of them cannot get going; but 36 per cent feel clogging in nose. Sour stomach bothers 32 per cent of them several times; 24 per cent feel trouble in getting to sleep; 22 per cent have so much personal worries that they feel somewhat apart even among friends.

#### *Recent Life Experience (Life Change)*

Table 4 shows that male teachers differ significantly on recent life experiences ( $t=3.385>.01$ ). Male teachers scored higher ( $M=16.23$ ,  $r=14.428$ ) than female teachers ( $M=7.4$ ,  $r=8.938$ ).

Table 5 shows rank value of the items on recent life experience of male and female teachers. In this table item No. 17 carries the highest value loadings

which could be interpreted to mean that 91 per cent of the respondents responded that they had major change in the health and behaviour of a family member; 80 per cent feel major changes in responsibility at work (e.g. promotion, demotion, lateral transfer); 79 per cent trouble with the neighbour; 77 per cent change in residence; 72 per cent major change in sleeping habits; Major change in social activity; Major change in the number of arguments with spouse; 62 per cent trouble with boss, major change in eating habits, 60 per cent sickness of a family member, major change in financial state; sexual relation of wife or husband with other man or woman; 57 per cent major business readjustment, major change in family get-together; 55 per cent death of a close family member, major change in self-concept or self-awareness; 47 per cent increase or decrease in taking toxicated things; 45 per cent long leave without pay or long expensive travel; 40 per cent major change in working hours on conditions; 38 per cent trouble in getting social recognitions; 36 per cent major personal injury or illness; 34 per cent death of close friend; 32 per cent trouble with in-laws; 30 per cent major change in performing religious works; 28 per cent spouse beginning or ceasing walk outside; 25 per cent trouble in business; 23 per cent gaining a new family member; major change usual type and or amount of recreation; taking on a mortgage of property or heavy loan; 21 per cent pregnancy.

TABLE 1  
Correlation between Psycho-physical Strain and  
Recent Life Experience

Variables	N	M	S.D.	r
Psycho-physical Strain	80	4.575	2.48	2.33
Recent Life Experience	80	7.837	8.80	

TABLE 2  
Comparison of Male and Female Teachers on  
Psycho-physical Strain

Groups	N	M	S.D.	SED	t
Male Teachers	30	6.6	5.60	2.11	15.535
Female Teachers	50	3.36	2.53		p>0.01

# LIFE EXPERIENCE ON MENTAL HEALTH OF SCHOOL TEACHERS

TABLE 3

**Rank Value of the Item on Psycho-physical Impairment  
among Male and Female Teachers**

<i>Rank</i>	<i>Item</i>	<i>Value Loadings</i>
1.	Wonder anything worthwhile	78
2.	Hot all over	66
3	Worrying Type	62
4.	Feel weak all over	60
5.	Nothing turns out right	58
6	Cannot get going	38
7.	Clogging in nose	36
8.	Sour stomach	32
9.	Trouble getting to sleep often	24
10.	Feel somewhat apart even among friends	22
11.	(i) Shortness of breath often	16
	(ii) Memory alight	
	(iii) Cold sweets often	
12.	Hands tremble often	14
13.	(i) Appetite poor	12
	(ii) Nervous often	
14.	Low and very low spirits	4
15.	Fainting (More than a few times)	2

TABLE 4

**Comparison of Male and Female Teachers on  
Recent Life Experiences**

<i>Groups</i>	<i>N</i>	<i>M</i>	<i>S.D.</i>	<i>SED</i>
Male Teachers	30	16.23	14.428	3.385
Female Teachers	50	7.4	8.938	2.608

# LIFE EXPERIENCE ON MENTAL HEALTH OF SCHOOL TEACHERS

TABLE 5

**Rank Value of the Items on Psycho-physical Impairment  
among Male and Female Teachers**

<i>Rank</i>	<i>Item</i>	<i>Value Loadings</i>
1.	Major change in the health and behaviour of a family member	91
2.	Major change in responsibility at work	80
3.	Trouble with neighbour	79
4.	Change in residence	77
5.	(i) Major change in sleeping habits	72
	(ii) Major change in social activity	
	(iii) Major change in the number of arguments with the spouse	
6.	(i) Trouble with boss	62
	(ii) Major change in eating habits	7
7.	(i) Sickness of family member	60
	(ii) Major change in financial state	
	(iii) Sexual relation of wife or husband with the other man or woman without consent	
8.	(i) Major business readjustment	57
	(ii) Major change in the family get-together	
9.	(i) Death of the close family member	55
	(ii) Major change in self-concept or self-awareness	
10.	Increase or decrease in taking toxicated things	47
11.	Long leave without pay or long expensive journey	
12.	(i) Major change in working hours/conditions	40
	(ii) Cheating, theft, dacoity	
	(iii) Major change in living conditions	13
13.	Trouble with getting social recognition	38
14.	Major personal injury or illness	36
15.	(i) Casual employment	34
	(ii) Death of close friend	
16.	Trouble with in-laws	32
17.	Major change in performing religious work	30
18.	Spouse beginning or ceasing work outside the home	28
19.	Trouble in business	25
20.	(i) Gaining new family member	23
	(ii) Major change in type and/or amount of recreation	
	(iii) Took on mortgage or heavy loan	
	(iv) Anybody left home in the family	
21.	(i) Pregnancy	21
	(ii) Broke or had broken a marital engagement	

## Discussion

The results of the present study reveal that psycho-physical strain is positively correlated with recent life experience (life change). These two variables have shown that higher score on recent life experience leads to the psycho-physical strain. These findings are supported by Leafviff *et al.* (1979). It is clear from the above results that male teachers are more influenced than female teachers. These findings differ from the previous findings reported by Chesler, 1972; Redloff, 1975; Martin, Thomas and Frank, 1975; Carstairs and Kapur, 1976; Hannary, 1979; Penfold, 1981; Mishra and Sharma, 1982; Shirali and Kanwar, 1980 and Sharma, 1990. It is also clear from the above results that there is a certain amount of psycho-physical disturbances in the male and female teachers. Teachers consider that major change in number of family get-together, major change in responsibility at work, trouble with the neighbour, change in residence, major change in sleeping habits, revision of personal habits, major change in number of arguments with spouse, trouble with boss, major change in eating habits, major change in health and behaviour of a family member, major change in financial state, sexual relation of wife or husband with other man or woman, major change in relation with the family members, death of close family member, increase or decrease in taking toxicated things. These are the main factors which cause psychophysical strain in the male and female teachers. These findings are supported by Punam Rani Shukla (1989), Zena, M. *et al.* (1990), Thankachan and Kodandaran (1992).

## Conclusion

The above analysis reveals that recent life experience (life change) influence the mental health of teachers. Stress makes the teachers with predispositions to mental disorders more vulnerable. It is important to note that male teachers are more inclined towards the mental illness. These findings differ from previous studies. The mental illness of teachers will adversely affect the development and mental health of the students. Therefore, counselling services/orientation programmes should be arranged to manage the mental health of the school teachers.

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# Peer Counselling in the Educational Scenario

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THE peer influence is one of the best methods of utilising the resources of students and their ability to help others. Seeking the help of the peer group was always a part of human behaviour, from time immemorial. In the academic scenario, the monitorial system prevalent in the gurukulas and the peer tutoring of 19th century in England, are some of the examples of utilisation of students to help fellow students. But, it is a relatively recent phenomenon to utilise the peers for affective education.

## Definitions

Though the term 'peer facilitator' is preferred by authors (Myrick & Erney, 1979; Bhatnagar 1993) in order to denote the non-professional status of the peer counsellor, in this paper both terms are utilised as we too agree with Downe and Nysetvold (1986) in their agreement that the label attached to the individual trained to interpersonal helping is less important than actual work performed.

Peer counselling is a process in which trained, supervised students are selected to help in the systematic facilitation of affective growth and development of effective coping skills among other students (Downe, Altman and Nysetvold, 1986)

A peer facilitator is someone who cares about others and who talks with them about their thoughts, and feelings. Rather than being an 'advice giver' or 'problem solver' a peer facilitator is a sensitive listener who uses communication skills to encourage self-exploration and decision-making. (Myrick and Erney, 1984).



D'Andrea (1987) defines peer counselling as the active use of listening and problem solving skills together with knowledge about growth and development by students in order to help, advise and counsel other students.

### **Why Peer Counselling is Useful**

There is empirical evidence to support the view that the students in schools and universities prefer the peer counsellor to professional counsellors. (Craser and Crasello, 1979; Morey and others, 1989).

Peer counselling was found to be useful in a wide range of situations. Some of them are listed below.

1. Helps to promote social skills
2. Fosters Behavioural changes
3. Trains to help friends in stress
4. Facilitates rehabilitation of clients of mental retardation and developmental disorders
5. Aids in the academic achievement through peer tutoring
6. Acts as an effective tool to cope with racism
7. Facilitates the community health programmes in preventing suicides, drug addiction, alcohol abuse and sex education
8. Helps the senior citizen
9. Aids in the teacher education through peer coaching.

### **Peer Counselling in the School Setting**

It has not been and will not be possible to cater to the counselling needs of all schools in India in terms of professionally qualified personnel due to economic constraints and also due to lack of trained professionals (Bhatnagar, 1993). Therefore, because of economic compulsions and pressure on the time of counsellor, para professionals like peer counsellors are considered in order to obtain the goals such as:

1. To increase counselling effectiveness
2. To increase the visibility of the counselling programme
3. To organise and use the students, abilities to help one another and
4. To facilitate psychological growth of the trainee.

## PEER COUNSELLING IN THE EDUCATIONAL SCENARIO

Peer counselling programme has been utilized in a remedial or treatment-oriented model for the delivery of helping fellow students in a group setting, as aid to professional counsellor or teacher in a wide range of areas such as:

1. To discuss personal concerns
2. For promoting the personal growth of both the peer counsellor and their clients
3. To provide academic help
4. For resolution of disputes on school grounds.

### Peer Counselling in the College Setting

Peer counselling has been found effective not only in the elementary and high schools but also in the universities and colleges. The roles played by peer counsellors vary widely as evident from the various studies.

1. In the treatment and prevention of disordered students
2. To increase the use of counselling services
3. Enhancing college retention rate
4. Adapting to critical life transitions
5. To inculcate vocational skills
6. To prevent alcohol and drug abuse
7. For treating shyness.

### The Process of Peer Counselling

The process of peer counselling involves the three phases:

A. Selection, B. Training and C. Evaluation

#### A. Selection

Augelli and Danish (1976) have defined selection in terms of present level of interpersonal skilfulness, that is those personal qualities and behavioural capabilities that are assured to reflect future trainability or competence in helping.

Selection versus training in the development of para professionals has been the focus of many studies. Studies have shown that those with high or low counselling potential possess certain personal characteristics (Sandler, 1972; Krammer *et al.* 1979; Jackson, 1986) and some studies have shown that training was the significant main effect (Hart and King, 1979; Gantt *et al.* 1980).

The method of selection varied from programme to programme. The following methods rather independently or in combination could be utilized.

1. Student self-selection or volunteering (Myrick and Bowman, 1980; Rockwell and Dustin, 1979)
2. Sociometric method (Downe, Altmann, Nysetvold, 1986)
3. Psychometric assessment of motivation, self-concept, attitudes, or other personal characteristics. (Bowman and Myrick, 1980; Morey, 1993).
4. Faculty nomination (Downe, Altmann, Nysetvold, 1980; Rockwell and Dustin, 1988; Leibowitz and Rhoads, 1974)
5. Assignment method (Bowman and Myrick, 1980)
6. Interview method (Leibowitz and Rhoads, 1974)

As selection is the most important determinant in the overall success of the programme, every possible precaution should be taken while selecting candidates for peer counselling.

The trainer is another very important component in the success of a peer counselling programme. Characteristics of successful trainees include intellectual curiosity, physical fitness, pragmatic outlook, problem-solving skills and dedication.

### *B. Training the Peer Counsellors*

There is much evidence to indicate the importance of structured training programme for training persons for a formal helping role (Mahan and Altmann, 1977).

The four major issues in peer help training are (i) time constraints, (ii) the need for age appropriate training curriculum, (iii) the need for logical and systematic presentation of concepts and skills, and (iv) student availability (Bowman, 1986).

The training programmes vary from one another in terms of:

- (a) training activities,
- (b) the length and intensity of training programmes,
- (c) method of training, and
- (d) the curriculum and the skills that are emphasized.

(a) *Training Activities:* Rockwell and Dustin (1979) have given the following training activities for peer counsellors:

- i. Training for referrals
- ii. Training about the counselling office
- iii. Training about the educational setting
- iv. Training in communication skill
- v. Training in self-awareness
- vi. Training in group techniques

(b) *Length and Intensity of Training:* The length of training and the number of skill training session varied considerably from programme to programme. Henriksen (1991) trained 9th grade for a single semester. House and Wohlt (1989) gave peer tutors 11 hours' training. Farley and Akridge (1986) trained vocational rehabilitation clients for 24 hours, and Guttman (1989) compared the verbal interactions of peer-led group counselling between high training (1 year) and minimally trained (4 hours) and the results indicated no significant differences between two groups.

In the Junior counsellor programme conducted by Bowman and Myrick (1980) the groups met twice in a week for seven weeks (45 minutes duration) and they progressed through seven training phases.

Phase I	Getting started (Session I)
Phase II	The nature of helping (Session 2-3)
Phase III	Feelings (Session 4-5)
Phase IV	Listening (Session 6)
Phase V	Helping responses (Session 7-10)
Phase VI	Problem-solving (Session 11-12)
Phase VIII	Other things to remember (Session 13-14) (Conclusion)

In most cases, training tended to be conducted in a small group that met with the professional coordinator on several occasions to discuss and practice specific helping skills.

(c) *Methods of Training:* There are various methods of training available to counsellor to train peer counsellors. Some of them are listed below:

1. Centralized training (de Rosenroll, 1990)
2. Neurolinguistic programming (Farley, 1989)
3. Role playing
4. Video-taped feedback for improving reinforced behaviour
5. Lecture and group discussion
6. Micro counselling.

(d) *Curriculum in Peer Counsellor Training*: The substance of learning to be imparted through the training varied from programme to programme. The wide range of topics included, the communication skills, helping skills, leadership skills, problem-solving and decision-making abilities, group process skills, learning styles in mathematics or science or any other subject, sensitization to the unique tasks such as to deal with children from disrupted family or victims of other unfortunate events, professional manners such as appearing rested, looking neat and clean and be on time counsellor ethics and confidentiality (Leibowitz and Rhoads, 1974; Farley and Akridge, 1986; House and Wohlt, 1989, Henriksen, 1991; Morey, 1993)

Barnett and Harris (1984) found that students preferred a peer counsellor who provided instrumental responses (giving advice and suggestions) over a peer counsellor who responded in a predominantly empathetic manner. (reflecting thoughts and feelings).

Peer counsellor training should therefore go beyond its primary emphasis on empathetic listening and move toward a consultative and collaborative model in which peer counsellors learn to work along side the student as a co-problem-solver (Morey, 1993; Tyles *et al.* 1983).

The role of the counsellor would be as peer group leader and facilitator, as well as psychology educator, liaison with parents, and resistant consultant on student behaviour.

### C. Evaluation

Evaluation is necessary for the accountability and survival of peer counselling programme. Evaluation is the assessment of the extent to which the goals or objectives are attained with respect to specified standards. In instructional counselling evaluation always occurs at three levels:

- (a) Evaluating the counsellor behaviour
- (b) Evaluating the client behaviour and
- (c) Evaluating the impact of the programme as a whole.

Although the three spheres are interdependent and overlapping one another, they are described below.

(a) *Evaluating the Counsellor Behaviour* It is necessary to evaluate the counsellors purposeful use of counselling skills, the degree to which the counselling skills are appropriate for instructional objectives, and the prowess with which the counsellor uses the skills. The counsellor's attainment of counselling skills could be assessed through various means as given below:

1. Observation (de Rosen roll, 1989) using counsellor verbal category system (Banaká *et al.*, 1985).
2. Written tests and check-lists to measure the knowledge, understand-

- ing of concepts and attainment of skills (Bowman and Myrick, 1980; Akridge and others, 1987).
3. Self-evaluation of interview performance or critique of recorded peer counselling service by the fellow peer counsellors (Leibowitz and Rhoades, 1974; D'Augelli and Danish, 1976).
  4. Supervisors' ratings on a five-point Likert scale (Tinsley and Tinsley, 1977).
  5. Evaluation by the peers about the counsellors' suitability and satisfaction obtained (Morey, 1993).

(b) *Evaluating the Counsellor Behaviour:* The counsellor must have some means for assessing whether or not the client is responding as the counsellor intended. The counsellor's behaviour could be assessed in various ways:

1. Monitoring the treatment implementation. Both the clients' self-monitoring system (Doyle and others) or some third party observation using client verbal behaviour system (Banaka *et al.* 1985).
2. Questionnaires such as peer counselling helping style questionnaire and peer counselling consumers satisfaction questionnaire (Morey *et al.* 1993).

(c) *Evaluating the Impact of Programme as a Whole:* Downe, Altmann and Nysetvold (1988) support the view of identifying the needs in a specific setting and then developing instruments to determine whether the programme has met those needs. Factors such as speed, and durability of the behavioural change; transfer of training of assessed could give a complete picture of the success or failure of the programme.

### **Why Peer Counselling is Suitable to India**

In India, where even professional counselling service has faced umpteen impediments peer counselling has not taken roots. Educators are concerned about the well-being of students and, therefore, in the school situation in the absence of full-time professional counsellors peer counsellors can be encouraged (Bhatnagar, 1993). From the studies we have reviewed, peer counselling programmes are beneficial to both the peer counsellors and to their clients, in the following ways:

1. It enhances social skills.
2. It helps in the development of cognitive skills.
3. It is effective in coping with behavioural disorders.
4. It facilitates language teaching and communication skills.
5. It facilitates adjustment.

6. It could be used effectively in the prevention and rehabilitation of cases of drug abuse, sex offenses, AIDS among adolescents
7. It could be used as tool in the qualitative improvement of teacher education through peer coaching.
8. It strengthens the professional counselling services.
9. It is more pragmatic as it does not add any economic burden.

## Conclusion

In India, if the peer counselling is made an integral part of the school system, it will enable us to overcome the financial constraints in providing the benefits of professional counsellors to all students. Unless there is an awareness among the teachers and counsellors about the potentialities of the peer counselling programme, they will not devote some time to train and supervise peer counsellors, and also to learn the skills needed to train and supervise. Therefore, there should be adequate administrative support for the success of the programme.

But peer counselling can never fully substitute the professional counselling, as Guttman (1989) has found out from his study, on verbal interactions of professional and peer-led group counselling sessions, groups led by professional counsellors were more therapeutic, risk-oriented, and work-oriented, and less socially oriented than group led by peer counsellors.

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# **Trainees' Appraisal of the B.Ed. Part-time Programmes in Nigerian Universities**

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THE full-time programme in education remained for a very long time a very viable strategy in the production of human resources for the education sector in Nigeria. This traditional approach to the production of education personnel consequent upon the emergent internal and external ecological dynamics of the school system became inadequate later in the day. It could no longer cope with the demand for teachers in terms of number and quality particularly at the secondary school level. According to Federal Ministry of Education (1989), out of 137,734 secondary school teachers in 1987 in Nigeria, 31,791 were unqualified. In 1988 out of 133,743 teachers, 31,115 were unqualified.

The inability of the traditional (full-time) approach to cope with the demand for teachers of high quality could be traceable to various factors. One major reason was the introduction of the 6-3-3-4 education system which is vocationally oriented. The pre-vocational subjects: woodwork; metal work; electronics; mechanics; local crafts; home economics and business studies which were introduced require vocational/technically trained education personnel to deliver the service to learners.

Even if the full-time approach in education personnel production is able to supply the required number and quality of these personnel, the pre-teaching employment training will become obsolete over time. This is where re-training of education personnel becomes imperative. The National Policy on Education (1981) recognized the need to continuously re-energize the teaching force when it stated that:

Teacher education will continue to take cognizance of changes in methodology and in the curriculum. Teachers will be regularly exposed to innovations in their profession. In-service training will be developed as an integral part of continuing teacher education.

Unfortunately, the admission of serving teachers into full-time programmes is contingent on many administrative factors which do not favour many needy potential trainees. Obemeata (1991) supported this with the assertion that "even if it had been possible, the spite of the poor economic situation in the country, to provide adequate facilities for the training and re-training of teachers, it will not be possible to allow too many teachers to embark on a full-time programme at the same time." As an innovation in education personnel production, part-time programmes in education became popular in Nigerian universities for serving teachers with the Nigerian Certificate in Education (NCE); graduate teachers without teaching qualification(s) and graduate teachers with professional training. The contact system practised in the delivery of part-time education service are the sandwich/holiday; weekend; correspondence and distance learning and evening types.

In the eighties, the B.Ed. part-time in education became not only popular but very competitive among Nigerian universities in the bid to recruit participants. In turn the demand for the programme became very high. This was exacerbated by the ultimate policy of the Federal Government to make Nigerian Certificate in Education (NCE) the minimum entry qualification into the teaching profession. Above all it was not easy reabsorbing serving teachers on their return from full-time training because of acute shortage of funds to pay for their services. Between 1984/85 and 1989/90, the universities of Nigeria, Nsukka, Port Harcourt, Benin admitted 11,094; 4,736 and 2,406 trainees respectively. Bendel State University, Abraka Campus recruited 2,774 between 1988/89 and 1989/90 (Nwadiani, 1992).

Unfortunately, as crucial as this innovation in teacher education is, there have been mounting waves of public alarm with respect to the programme itself. Two major issues that have persistently been alleged are centred on quality of inputs and outputs and the commercialization of the programme in some universities. What has not been revealed despite the spate of criticisms is how trainees value the programme. The purpose of this study is to investigate critically trainees' appraisal of the B.Ed. part-time programmes in Nigerian universities. The outcome of this study should be of great significance to education policy and their implementers to the extent that it reveals the effectiveness in the B.Ed. programme management in Nigerian universities. This has become very necessary because of the seeming abuse of this innovation by some universities because of the 'economic gains'.

The following questions were posed to guide the study:

1. How do trainees rate some aspects (learning environment; pedagogical organisation; internship; programme management information flow; teaching-learning resources; duration of the programme and academic work-load of trainees) of the B.Ed. part-time programme in Nigerian universities?

2. Will trainees' ratings of the B.Ed part-time programme differ with respect to academic disciplines (humanities or science)?
3. Will trainees' ratings of the B.Ed. part-time programme in education differ with respect to age (young or old)?
4. How do B.Ed. part-time trainees perceive the management (organisation; staffing and funding) of the programme?

## **Methodology**

### *Sampling and Sample*

The population of the study, which was all the trainees in all the Southern universities running the B.Ed. part-time programmes, was stratified into science and humanities. Subsequently, probability proportion to size was applied to arrive at the real number of participants.

Finally, random sampling technique was adopted to select the sample. The sample was chosen from the selected universities of Benin, Bendel State, Port-Harcourt and Nigeria in this proportion: 100, 80, 93, and 101 respectively. In total, 374 trainees at various levels of study excluding the first level were finally sampled reflecting 224 and 150 in humanities and sciences respectively. Only 'stale' trainees were sampled since the fresh trainees might not be able to give a real appraisal of the programme. The socio-economic status of the subjects which, as revealed by the earlier work of Nwadiani (1992), was not significantly different and their pre-training qualification which is largely the Nigerian Certificate in Education (NCE) were held 'constant' in the sample selection.

### *Instrument*

The main instrument used for the study was titled: Trainees' Appraisal of B.Ed Part-Time Programme Questionnaire (TABPTPQ). The TABPTPQ which was designed by the investigator was subdivided into two sections, A and B. Section A elicited background information on trainees' age, sex, subject(s) of specialization and level/year of study. Section B had eight sub-units with a total of 40 items covering the aspects of the programme. Trainees' appraisal was based on whether the aspects of the programme are very poor, poor, adequate and / or very adequate the way they are operated. The instrument which was validated using a meta-analysis strategy had a reliability coefficient of 0.87.

### *Data Collection*

The data for the investigation were collected in 1992 by the researcher and five field assistants who were trained for two days. These research assistants

were post-master degree students in the faculties of education in the universities studied. One field assistant was assigned to each university. The TABPTPQ was administered to the selected trainees in person. Out of the 374 questionnaires administered, 282 were used eventually. Apart from the data from trainees, data on how the programmes are managed were collected from those in charge. These were information on organisation, staffing and funding.

### *Data Analysis*

Data analysis was done in stages. The collected data were first verified for accuracy. In turn they were collated and grouped according to age and academic discipline of trainees. The data were finally subjected to descriptive statistics. The following ranges of weighted means were used to assign appraisal values: 0.1 - 1.50 (very poor), 1.51 - 2.50 (poor), 2.51 - 2.99 (fairly adequate), 3.00 - 4.00 (adequate) and > 4.00 (very adequate). 't' test statistic was also used.

### **Results**

The following results as presented emerged from the investigation.

#### *Question 1*

How do trainees rate some aspects of the B.Ed. part-time programmes in Nigerian universities?

The opinion data from this investigation revealed that the B.Ed part-time programme in education in Nigerian universities studied was poorly rated by trainees. Expressing their opinions about specific aspects of the programme, trainees very poorly rated programme management information flow (N = 282, WX = 1); and the learning environment (N = 282, WX = 1.50) as shown in Table 1.

Other aspects of the programme were poorly valued such as the teaching-learning resources (N = 280; WX = 2); cost of the programme (N = 271; WX = 2) and the academic workload (N = 277; WX = 2.5) as reflected by the number of trainees expressing such opinions and the weighted mean in parentheses. According to the trainees, while the duration of the programme (N = 281; WX = 2.80) was fairly adequate, pedagogical organisation (N = 279; WX = 3.00) and internship system (N = 280; WX = 3.00) are just adequate.

#### *Question 2*

Will trainees' ratings of the B.Ed. part-time programme differ with respect to academic disciplines (humanities or science)?

TABLE 1

**Trainees' Rating of Some Aspects of the B-Ed. Part-Time  
Programmes in Universities**

S.No.	Aspects of the Programme	N	$\bar{X}$	$\frac{\text{Weighted}}{\bar{X}}$ Sum	Sd	Rating Value
1.	Learning environment	282	8.241	1.50	2324	2.818 Very poor
2.	Pedagogical organization	282	27.904	3.00	7869	6.145 Adequate
3.	Internship	282	15.280	3.00	4309	6.134 Adequate
4.	Programme management Information flow	282	5.387	1.00	1519	2.162 Very poor
5.	Teaching-Learning resources	282	8.649	2.00	2439	2.749 Poor
6.	Duration of the resources	282	13.138	2.80	3705	4.527 Fairly adequate
7.	Cost of the programme	282	7.138	2.00	2103	2.542 Poor
8.	Academic workload	282	10.394	2.50	2931	2.620 Poor
9.	Overall programme	282	17.85	2.23	5034	3.742 Poor

Source: Investigator's fieldwork.

The ratings of the B.Ed. part-time programme in education by trainees in humanities and sciences was analysed with the 't'-test statistic as presented in Table 2.

Table 2 revealed that when the 't'-test values with respect to the aspects of the B.Ed. part-time programme were compared to the table value (1.960) with 280 degree of freedom at 0.05 probability level the differential ratings of the trainees were only significant in learning environment (2.63); pedagogical organization (-2.25); internship (3.03) and cost of the programme (-2.01). There was no significant difference in their appraisal of programme management information flow (-.73); teaching-learning resources (1.73); duration of the programme (-1.40) and academic workload (-1.40).

# B.ED. PART-TIME PROGRAMMES IN NIGERIAN UNIVERSITIES

TABLE 2

**'t'-test Analysis between Science and Humanities' Trainees' Rating of the B.Ed. Part-time Programme in Education in Nigerian Universities**

S No.	Aspects of the B.Ed. Programmes	Group	N	$\bar{X}$	Sd	df	t	Table Value	Conclusion
1.	Learning environment	G <sub>1</sub>	100	8.8300	3.039	280	2.63		Sig.
		G <sub>2</sub>	182	7.9179	2.642				
2.	Pedagogical organization	G <sub>1</sub>	100	26.8000	5.274	280	2.25		Sig.
		G <sub>2</sub>	182	28.5110	6.509				
3.	Internship	G <sub>1</sub>	100	16.7500	6.441	280	3.03		Sig.
		G <sub>2</sub>	182	14.7425	5.820				
4.	Programme management Information flow	G <sub>1</sub>	100	5.2600	1.993	280	.73	1.960	NS
		G <sub>2</sub>	182	5.4560	2.251				
5.	Teaching-learning resources	G <sub>1</sub>	100	9.0300	2.921	280	1.73		NS
		G <sub>2</sub>	182	8.4396	2.635				
6.	Duration of the programme	G <sub>1</sub>	100	12.6300	2.505	280	1.40		NS
		G <sub>2</sub>	182	13.4176	5.307				
7.	Cost of the programme	G <sub>1</sub>	100	7.0500	1.946	280	2.01		Sig.
		G <sub>2</sub>	182	7.6813	2.797				
8.	Academic workload	G <sub>1</sub>	100	10.1000	2.190	280	1.40		NS
		G <sub>2</sub>	182	10.5549	2.822				

Source: Fieldwork P = 0.05

G<sub>1</sub> = Science G<sub>2</sub> = Humanities NS = Not Significant Sig. = Significant

### *Question 3*

Will trainees' ratings of the B.Ed. part-time programme in education differ with respect to age (young or old)?

The 't'-test statistic was used to test this difference as shown in Table 3.

The information in Table 3 showed that there was no significant difference between the young and old trainees in all the aspects of the programme except with respect to learning environment (-2.15) and teaching-learning resources (2.58).

### *Question 4*

How do B.Ed. part-time trainees perceive the management of the programme?

There is no uniformity in the management of B.Ed. part-time programme in Nigerian universities as perceived by the trainees. While in the University of Nigeria, Nsukka, the programme is housed and managed by the Institute of Education, in other universities apart from the University of Lagos which has a long-standing and established Correspondence Education Centre, the programme is run by the committee members appointed within the Faculty of Education as sub-programme coordinators. A Chief Coordinator is appointed by the Dean of Faculty to head the committee. In most universities, heads of academic departments within the faculty are not official members of the committee that is in-charge of admission and registration of new trainees, administration of examination and compilation of results and other incidental functions.

As regards staffing of the programmes, there are four main sources of lecturers for the B.Ed. part-time programme in the operating universities. These are:

- Regular full-time lecturers of each university.
- Part-time lecturers from other higher institutions such as Colleges of Education; College of Science and Technology and neighbourhood universities.
- Postgraduate students.
- Non-academic (supportive staff) within each university.

In most of the universities studied, substantial evidence revealed that courses are allocated to lecturers who don't teach them during the regular full-time programme even when they are not real specialists in those fields. This is because of the additional financial reward involved.

Trainees (93 per cent) expressed serious dissatisfaction with the funding pattern of B.Ed. part-time programme. They were also very negative in their opinions about the way the generated revenue is managed. The main source

# B.ED. PART-TIME PROGRAMMES IN NIGERIAN UNIVERSITIES

TABLE 3

**'t'-test Analysis of How Young and Old Trainees Rate the B.Ed. Part-time Programme in Education**

S.No.	Aspects of the Programmes	Group	N	$\bar{X}$	Sd	df	t	Table Value	Conclusion
1.	Learning environment	G <sub>1</sub>	64	7.5781	3.275	280	-2.15		Sig.
		G <sub>2</sub>	218	8.4358	2.646				
2.	Pedagogical organization	G <sub>1</sub>	64	27.5313	6.409	280	-.55		NS
		G <sub>2</sub>	218	28.0138	6.077				
3.	Internship	G <sub>1</sub>	64	15.5938	8.234	280	0.46		NS
		G <sub>2</sub>	218	15.1881	5.385				
4.	Programme management information flow	G <sub>1</sub>	64	5.2813	2.164	280	-0.44	1.960	NS
		G <sub>2</sub>	218	5.4174	2.165				
5.	Teaching-learning resource	G <sub>1</sub>	64	9.4219	2.724	280	2.58		Sig.
		G <sub>2</sub>	218	8.4220	2.721				
6.	Duration of the Programme	G <sub>1</sub>	64	12.8750	2.112	280	-.53		NS
		G <sub>2</sub>	218	13.2156	5.022				
7.	Cost of the programme	G <sub>1</sub>	64	7.2656	2.686	280	-.69		NS
		G <sub>2</sub>	218	7.5138	2.502				
8.	Academic workload	G <sub>1</sub>	64	10.0158	2.250	280	-1.31		NS
		G <sub>2</sub>	218	10.5046	2.714				

Source: Fieldwork P = 0.05

G<sub>1</sub> = Young Students G<sub>2</sub> = Old Students NS = Not Significant Sig. = Significant

of fund for managing the programme is tuition fee paid by trainees which varied from university to university. The percentage of the generated revenue allocated to the generating unit (Education Faculty or Institute of Education) for programme operation cost and development varies.



Except in the University of Nigeria, Nsukka where a large proportion of the revenue is managed by the Institute of Education, in other universities, only between 50 and 60 per cent of the revenue is allocated for operational cost. In the University of Benin, the university's Central Administration takes 50 per cent of the revenue while only 50 per cent is used by the Faculty of Education to manage the programme.

Above all, the B.Ed. part-time programme is not integrated into the universities' administrative arrangement. The programme is run when time permits depending on the 'effectiveness' of full-time university programmes' calendar, that is not stable in contemporary Nigeria.

### Discussion

The investigation which was an evaluation of the B.Ed. part-time programme in Nigerian universities concentrated on the appraisal of the innovation largely by the trainees themselves. Generally, the investigation revealed that the B.Ed. part-time programmes in Nigerian universities as they are operated now are very poorly managed as perceived by the trainees. The trainees very poorly rated the following aspects of the programme in that order: programme management information flow; learning environment; teaching-learning resources; cost of the programme to trainees and academic workload.

The flow of management information is not only over-delayed but highly 'secretive'. Trainees expressed their most profound negative opinion with respect to this aspect of the programme. Trainees have no access to information that are required for their training particularly information about training resumption dates; programme arrangements; and examination results among others. The undue bureaucratization of the organizational structure of the programme has made the 'managers' to perceive information meant for trainees as secret. The geographical spread of trainees around the country and the instability of programme time-table often have generated some frustration elements therefrom poor management information flow. Because of this, some trainees completely miss the programme or come so late during some holidays when the programme is usually run.

Another dark side of the B.Ed. part-time programme showed that the learning environment of the programme in all the universities studied is very unconducive. This is made worse by the practice of holding lectures in secondary schools which are not designed for adult learners. When the idea to introduce part-time B.Ed. programme was originally initiated, it was hoped that the programme would be run during long vacations to enable the trainees utilize the teaching-learning facilities of full-time programmes when the students are on holidays. This is like mirage because of the uncertainties in

Nigerian education system accompanied with unending strikes making it 'epileptic'.

Trainees also rated 'very poor' teaching-learning resources in the universities studied. The supply of learning materials was very inadequate because of the tendency to minimize 'cost of production' with the attendant profit orientation at the expense of genuine and quality education.

Reading texts are not always available and when available, they are outdated and very expensive as rated by 88 per cent of the trainees. The trainees unlike the full-time students have no full access to the library. Most universities' libraries operated skeletal services during the holidays. Because of the nature of the time-table of the programme which keeps the trainees busy from 8.00 a.m. till 6.00 p.m. daily without break, they have no time for library use. Trainees are usually 'rushed' during lectures in attempts to cover the course content since the actual duration at every contact period is always very short.

Because of what looks like commercialization of the B.Ed. part-time programme, it is generally believed that the cost to trainees is very high. Trainees who are privately sponsored have to bear the cost of the programme since it is self-supporting without any subsidy from the public. The acute shortage of reading materials has institutionalized the sale of 'handouts' which learners are 'forced' to buy in some universities. In the institutions that discourage the handout culture, 'teacher-made books' at very exorbitant prices have proliferated. Trainees are forced to buy them for in their own opinion, what matters in the end is 'certification'. The costs of accommodation and transportation in most of the cities where these universities are located have escalated in recent times thereby increasing the private cost of running the programme.

The only aspects of the programme valued by the trainees are the duration of the programme; pedagogical organisation and internship. It is not surprising that these aspects of the programme are rated as adequate by the trainees. In the first instance comparing the part-time and the full-time programmes in terms of effective time use, the former is very short. Most of the part-time programmes are held with shorter duration even when it is not convenient to do so making the whole exercise to appear like 'B.Ed. degrees as a give-away commodity'. For example, there are some double standards in admission requirements and programme duration. While the University of Benin admits trainees with at least NCE merit pass into the five-year programme, other universities admit into their four-year programme trainees with such qualification and even sometimes with lower entry requirements. The University of Nigeria, Nsukka admits trainees with NCE ordinary pass or Teachers Grade I or Associate Certificate in Education (ACE) into the five-year

programme. Trainees do their internship in most cases in the schools where they teach making it less strenuous.

The management of B.Ed. part-time programme has not been satisfactory in most of the universities. The use of the committee system raises the fear of commitment particularly when the heads of departments are not very much involved. Since part-time programmes have become institutionalized, they ought to be built into the administrative structure of universities rather than leaving the management to the organizing units. This will help in the programme's time management. Staff management in the programme delivery has a lot of shortcomings. The use of external lecturers is a very serious issue. The commitment of these lecturers is usually questionable. Above all they see the whole exercise as a money yielding activity. If most of these institutions hire services of lecturers who are not really in full-time academics, then the issue of quality of instruction could be raised. Why must organizing institutions run programmes that are larger than the full-time equivalents? In some cases, some lecturers who don't teach some courses during regular session and are not 'specialists' in those academic areas are appointed to teach because it involves additional money.

However, the main problem of funds management is the sharing arrangement between the organizing units and the parent institutions. In some universities, 50-40 per cent of the revenue goes to the institutions for doing nothing rather than sharing the profit. In the end, the fund-generating units have little or no money to effectively run the programme while the central administration 'play' with money. This is made worse by the high level of finance management indiscipline among our present day universities managers. The revenue that are being generated are shared by the university authority — taking as much as 50 per cent. The University of Benin is a case in point.

### **Conclusion and Recommendation**

This study concludes that the B.Ed. part-time programme in Nigerian universities as rated by the trainees are ineffectively operated with pronounced variations in admission requirements and their respective durations. Because of the implications for part-time/distance education geared towards the training of teachers, a serious rethink about the programme is highly recommended. Since the B.Ed. part-time programme has come to stay, a comprehensive National Policy on Part-Time Education should be evolved by the National Universities Commission (NUC) to monitor the activities of most universities. While 'developing universities' in Nigeria recently established should concentrate on their full-time programmes, there should be desig-

nated universities as centres for post-employment retraining of teachers reflecting Nigeria's regional characters. A department of part-time education, if established within the NUC, will be able to monitor the operations of this innovation. Above all, the part-time programme should be integrated into the university administrative structure like the full-time programme since their certificates are not differentiated.

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# **Attitudes of Participants towards Refresher Course**

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A TEACHER is the centre of the entire education system. To improve the status of teachers, the National Policy on Education (NPE) was introduced in 1986. As a part of it the Academic Staff Orientation Scheme (ASOS) has been sponsored by the University Grants Commission (UGC). The UGC has established 48 Academic Staff Colleges in 48 universities in India.

The main objectives of the course are to develop teacher in all aspects. Teachers possessing below five years of teaching experience are provided with orientation course and teachers having above five years of experience are provided with Refresher Courses. This helps teachers in exchange of experience in teaching learning process, in knowing latest advances in various subjects, it provides opportunities for further research studies and also helps teachers to discover innovative methods of teaching.

The investigator made an attempt to find out to what extent the above-stated objectives have been achieved by the Refresher Course held at Andhra University, Waltair, in Economics and Botany (5 to 30 September 1994) during the months of September-October 1994, under the Chairmanship of Dr K. S. Chalem.

For this investigation the investigator took into account attitudes of the participants. The participants constituted lecturers from different degree colleges. Attitudes refer to manner, feeling and position with regard to a person, situation or tendency. G.W. Allport defined attitude, 'as a mental or neutral state of readiness, organised through experience exerting a directive or dynamic influence upon the individuals' response to all objects and situations with which it is related'. Attitudes are learned in course of time. They are usually identified by the specific objects to which they are referred. Attitudes are tinged with emotion and are very personal and complex in character. Attitudes influence behaviour of the individual. The kind of environment in which he grows has an indelible impact on the attitudes he possesses. An attitude is always a pattern of ideas, motives and perceptions.

## **Definitions of the Terms Used**

### **1. Attitude**

Attitude has been defined as the perception of the participants towards Refresher Course.

### **2. Participants**

Participants constituted male and female senior lecturers having above five years' experience from different degree colleges of India.

### **3. Refresher Course**

It is a course run by the Academic Staff College, Andhra University, Waltair, for a period of four weeks in different subjects.

## **Objectives of the Study**

The main objectives of the study were:

1. To know whether Andhra University has succeeded in conducting Refresher Courses for senior lecturers coming from different degree colleges.
2. To know whether objectives of the UGC have been fulfilled or not.
3. To know the significant difference between the attitudes of Botany lecturers and lecturers from Economics Department towards Refresher Courses.

## **Hypothesis**

The following hypothesis was framed:

There is no significant difference in the attitudes of participants from Botany Department and from Economics Department.

## **Limitation of the Study**

The study was delimited to the following conditions:

1. The investigator took into account 20 participants out of 43 from Botany Department.
2. The investigator took into account 20 participants from Economics Department out of 23.
3. Refresher course conducted during September-October 1994 was taken into account.

## ATTITUDES OF PARTICIPANTS TOWARDS REFRESHER COURSE

4. Attitudes towards Refresher Course were taken during the middle of the course.

### Design of Study

Parallel Groups Design was followed. Groups consisted of participants from Botany and Economics faculty.

### Tools Used

Since there was no availability of standardized tool the investigator had to prepare an attitude scale. It consisted of 20 items. After standardization four items were deleted. Item analysis taking into account upper and lower limits using 't'-test was used for standardization. Reliability and validity of the test was found out. Out of the finalized 16 items, two items constituted negative and 14 items constituted positive statements. They were scored basing on Likert's five-point scale. Items were marked in the following way

Items	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Positive	5	4	3	2	1
Negative	1	2	3	4	5

### Procedure

The questionnaire was tried out on four participants. Then it was administered on participants from Botany and Economics Departments. The results were scored which ranged from 25 to 67. Means and SDs were calculated. For testing significant differences in attitudes 't'-test was adopted.

### Analysis and Interpretation of the Data

Means obtained were 53 for Economics and 46.9 for Botany. This shows that the mean scores were neither too high nor too low. SDs were 15.4 (Economics) and 10.79 (Botany). This shows that Refresher Course has helped the participants in gaining new knowledge and improving their professional efficiency. But the participants felt that the duration of the course should be reduced to 21 days and there should be provision for teaching through audio-visual aids. After each lecture research studies made in that particular topic should be enlightened. Some of the lectures like that on GATT, New Economic Policy, International Trade, preparation of lesson plan in teaching Economics interested participants to a great extent. Participants from Botany Department felt that one-day tour arranged by the Academic Staff College to

Araku Valley was of much use in collecting plants of botanical and medicinal value.

As the obtained 't'-value was 0.324, which is insignificant at 0.01 and 0.05 levels, the hypothesis that there exists no significant difference between the attitudes of participants from Botany and Economics Department was accepted. Scores should range from 16-80. In the study it ranged from 25-67. Means were 53-49. As the means were near maximum score and not near minimum score the Refresher Course conducted in Economics and Botany by the Academic Staff College, Andhra University, Waltair, during September-October 1994 proved useful to some extent and neared objectives of U.G.C.

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## **Demand for Education: A Socio-economic Analysis**

J. SRINIVASAN

ECONOMICS of Human Resources is an ever fascinating area of economic research in the sense that the subject is more attracted by economists all over the world. The so-called discipline 'Economics of Education' started developing soon after the presidential address was delivered by Theodore W. Schultz to the American Economic Association, during the year 1960. In the aftermath of the Second World War, people started realizing the economic value of human potentiality. As a matter of fact, the term 'Human Capital' came into existence and more attention was given by economists.

The concept of human capital can be viewed as the methods of estimating the cost of production and the capitalized earnings procedure about the value of human beings (Kiker, 1966). Correa (1963) has defined the subject economics of education, as the studies on the economic aspects of education and the influence of education on economic phenomena.

### **Statement of the Problem**

In Tamil Nadu, most of the schools at the secondary and higher secondary levels are located closeby that these distances can be covered by cycles or bus. The distance is therefore not an important problem for students. They also have fairly good school education facilities. The Directive Principles of the Constitution make it obligatory for every State Government to achieve good educational standards both at the primary and secondary levels. Varying records are available regarding school going children, withdrawn children and those with discontinued education.

A uniform change is reflected in the enrolment of the above categories, from one stage to the other. Children who remain in the system either have a good family background with educated parents who have an intention to

send their children to educational institutions. The other category are those who have individual motivation to attain high levels of education.

In Tamil Nadu parents with meagre income are mostly not interested in sending their children to educational institutions. Those children who belong to poor families, or come from families which are illiterates, with low educational levels, culturally disadvantaged, with poor socio-economic conditions are generally withdrawn from school. Not only in Tamil Nadu, but all over India large amounts have been invested in the education sector. The Government of India has also envolved a New Education Policy, providing equal educational opportunities to all socio-economic groups. In spite of all these efforts the enrolment in schools is dissatisfactory.

A conclusion drawn from the above discussion indicate that there is still a great demand for education. A number of questions can be raised here. Why and who demand education? Why there is no demand for education? What are the social, economic and cultural factors which affect the demand side of our educational system? To what extent does the family background contribute towards a demand for children's education? What are the distinguishing factors which decide the demand for education between rural and urban areas? An attempt is made in this work to find out the answers to these questions.

### **Significance of the Study**

The poor sectors of society have not received the benefits of educational planning and supply facilities. Thus in order to equalize educational opportunities, it is important to understand the structure of the socio-economic factors of a family and their relationship to demand for education. Even though a large number of empirical studies involving other countries are available in this area little reserach has been carried out in India.

### **Objectives**

1. To estimate the demand for secondary and higher secondary educaiton, in the three districts, comprising of one advanced, one medium and one backward districts of Tamil Nadu.
2. To identify the factors and examine their role in demand for education.

### **Hypotheses**

1. Family income plays an important role in the education of children, relating to socio-economic groups.

2. Mother's education plays an important role in children's education, in fact has a greater and a more decisive impact than father's education.
3. People at the bottom of socio-economic status marginally avail of the facilities available in the educational system, whereas the top of socio-economic group widely uses such facilities.
4. Distance from home to school adversely affects children's education.

### **Methodology and Tools for Analysis**

Becker (1981) advocates that an economic approach presents a framework applicable to all human behaviour. Since in most of the families, parents decide about children's school education, family should be the unit of analysis in the study. Family is an important decision-making unit in sharing the scarce resources. It decides about the current consumption and future investment in the children (Schultz, 1974). Becker has criticised the traditional theory of household behaviour framework, because the household utility function does not contain any details about the non-market activities. The demerits of this paradigm is that, it simply ignores the cooperation and conflict amongst family members in essence assuming that each household has only one member. Therefore, the present study employs the utility function, based upon the modern household economic framework, which considers both market as well as non-market activities.

In his initial work Becker (1965) attempted to explain the human capital formation and household time allocation. The new household economics framework is the same as that of the neo-classical framework; it maximizes the household utility function, subject to both income constraint and the time constraint. A household theoretical model has been developed on the basis of new household economics framework. The utility function consists of commodities like education, number of children and other composite commodities. The demand functions are derived from this utility function. Finally econometric estimation procedures are applied to these demand functions.

The analysis has been carried out by using the one-way frequency table, bivariate tables, simple statistics like mean, S.D., and multiple regression techniques. An index is calculated by dividing the share of enrolments in each community by the share of school-age population. This is called as the Representation Index. This index, according to caste, region and gender has been calculated. Since the dependent variable is dichotomous in nature, the appropriate econometric estimation techniques would be logit or probit methods. But due to some problems, the present study has not been able to

apply the above-said techniques. However, three dependent variables namely, school enrolment ratio (SER), average amount spent on education (TEE) and per pupil expenditure (FER) are regressed on various socio-economic factors. Multiple regression method has been followed for this exercise. For four different age-groups i.e. (5-17) (14-17), (14-15) and (16-17), regressions are carried out for total number of children, boys and girls separately.

### Data Source and Sampling Design

As there is no readymade data available for analysing the demand for education a data for the present study has been generated through a primary household random sample survey. In order to do this a questionnaire has been prepared based upon earlier studies. A pilot study has been made, before collecting the required number of household samples.

The districts for data collection were chosen on the basis of overall literacy rates. Since the present study wanted to locate the main factors responsible for the demand for education between rural and urban areas, an urban area was selected from an advanced district, a rural area selected from medium and backward districts. The questionnaire contained information on the general characteristics of a family children's educational characteristics, occupation and job search characteristics, income characteristics, etc.

TABLE 1

#### Field Work Details

<i>District</i>	<i>Area</i>	<i>Number of households</i>	<i>Total number of households</i>
(a) Madras (68.40%)	One urban area	300	
(b) Dharmapuri (29%)	Three villages	150	600
(c) Tirunelveli (52.44%)	Three villages	(50 households from each village)	150

*Note:* Figure in the parentheses show the districts overall literacy rates respectively.

The state of Tamil Nadu has a total area of 130,058 sq. kms. with total population of 4,49,43,826 comprising of 18 districts. The state's total literacy rate stands at 46.76 per cent, with male and female literacy levels at 58.26 per

cent and 34.99 per cent respectively (*A Social and Economic Atlas of India*, 1987).

For data collection the study adopted a simple random sampling procedure. Direct Interview method has been followed for data collection. The study chose three talukas from Dharmapuri district and three talukas from Tirunelveli district at random in the next stage village from each taluka. Hence a rural sample consisted of six villages.

## Major Findings

### *I. School Enrolment Rate*

(i) *Rural Areas*: Schooling of boys and girls is influenced by factors like father's education, mother's education and mother's age. Mother's education has a greater impact on children's education when compared to father's education. Caste factor significantly decides the education of both boys and girls. Father's education has a significant effect on the secondary level school going girls; this is, however, not so in the case of boys.

(ii) *Urban Areas*: The decision-making process in the context of both boys and girls education is mostly governed by socio-economic factors, such as father's education, mother's education, mother's age and logarithm of family income. Mother's education effect is more decisive than that of father's education. Father's education is not a significant factor for taking schooling decisions of both boys and girls at the secondary and higher secondary levels. Father's education is important. However in the education of secondary and higher-secondary level boys, mother's education plays a crucial role in the schooling of girls both at secondary and higher secondary levels.

(iii) *Rural and Urban Areas*: In both rural and urban areas, factors like father's education, mother's education and mother's age decide their children's education. Mother's education has a greater effect than that of father's education. Religious factor plays a vital role in the education of boys and girls at the secondary level. The logarithm of family income is important in the case of girls at the secondary level.

### *II. Average Amount Spent on Education*

(i) *Rural Areas*: The average amount spent on both boys and girls education is mostly guided by factors like mother's age and monthly consumption expenditure. Caste factor decides the average amount spent on boys education. Religious factor significantly affects the average amount spent on education. This has been observed in the case of girls of the secondary and higher secondary levels. Father's educational level determines the average

amount spent on education of secondary level boys and girls. Monthly consumption expenditure alone decides the average amount spent on education of secondary level boys.

(ii) *Urban Areas:* The average amount spent on both boys and girls education is often decided by factors such as father's age, and monthly consumption expenditure. Mother's age influences school attendance of girls. Monthly consumption expenditure is not an important factor determining the average amount spent on the education of boys at the secondary and higher secondary levels.

(iii) *Rural and Urban Areas.* The average amount spent on the education of boys and girls in rural and urban areas is determined by factors like mother's educational level and monthly consumption expenditure. Monthly consumption expenditure is the only factor that determines the average amount spent on the education of girls at the secondary and higher secondary levels. The total number of school-going children in the family affects the average amount spent on the education of both boys and girls at the secondary level.

### *III. Per-Pupil Expenditure*

(i) *Rural Areas:* The per-pupil expenditure is mainly guided by factors like mother's educational level, monthly consumption expenditure and the total number of school-going children in the family. Mother's age and religious factors play a crucial role in the per-pupil expenditure of girls especially at secondary and higher secondary levels. Among these factors, the total number of school-going children in the family seems to be the most important factor in deciding the per-pupil expenditure.

(ii) *Urban Areas:* Total number of school-going children and monthly consumption expenditure are the basic factors which determine per-pupil expenditure. Religious factor decides the per-pupil expenditure of female children. The per-pupil expenditure at secondary and higher secondary level of education of both boys and girls is determined by the total number of school-going children in the family.

(iii) *Rural and Urban Areas:* In both rural and urban areas, the per-pupil expenditure is mostly guided by factors such as mother's educational level, caste, economic status of the family, monthly consumption expenditure and total number of school-going children in the family. Father's age is a deciding factor of per-pupil expenditure in the case of boys and girls at the secondary level. In this case, parental support for education influences the per-pupil expenditure. In the case of higher secondary level boys and girls, factors like area of habitation and mother's age have an impact on the per-pupil expenditure.

*IV(i)* In rural as well as urban areas, the expected monthly foregone earning of higher secondary level students is larger than that of secondary level students.

*(ii)* It is observed that in rural areas boys of the secondary level receive better education than girls. The reason is that parents are generally motivated to spend more on boys, as compared to girls

*(iii)* In rural areas, it is observed that the average amount spent by parents on education of boys of secondary and higher secondary levels is more than that of the girls.

*(iv)* In urban areas, Forward Class (FC) secondary and higher secondary level students obtain relatively better education than Scheduled Caste (SC), Scheduled Tribe (ST) and Backward Class (BC) students.

*(v)* Results based upon the estimates of per-child schooling expenditure for different castes, reveal that in rural areas students of SC and ST secondary and higher secondary students are receiving inferior quality education as compared to the students of BC and FC. However, there is no difference in the quality of education received by the students of FC and BC students.

*(vi)* In rural areas, the monthly average amount spent on education by BC parents is more than the amount spent by FC, SC, and ST parents.

*(vii)* In rural areas, the demand for secondary level education is higher than the demand for higher secondary level education.

*(viii)* In both rural and urban areas, different communities at the secondary and higher secondary levels have unequal participation rates.

#### *V. Representation Index Estimates*

*(i)* In rural areas, according to the values of the representation index, a persistent inequality exists in the educational distribution, between different castes and between boys and girls of school-going age. A similar picture emerged in the case of urban school-going children.

*(ii)* In both rural and urban areas, boys and girls are equally represented in the secondary level schools. The higher secondary level boys are equally represented but girls are under-represented in relation to their total population.

*(iii)* In rural areas, the value of representation index is consistently less for girls in relation to that of the boys.

### **Policy Recommendations**

(i) Both in rural and urban areas, steps should be taken to educate illiterate parents, through Adult Education and Non-formal Education programmes. This will enable them to realize the importance of their children's education.

(ii) In rural areas, more schools should be set up at the secondary and higher secondary levels. Separate girls' schools should be set up to improve their education.

(iii) Job opportunities should be increased in order to attract students for secondary and higher secondary classes.

(iv) As the demand for higher secondary and secondary levels of education depends upon the demand for primary and elementary levels of education, more emphasis should be given to the latter as compared to the former.

(v) Both in rural and urban areas, parents should have a planned family size, this should enable them to provide their children with better schooling facilities.



# **A Study of Reliability and Validity of Entrance Tests Introduced for Admissions in Banaras Hindu University**

USHA SINGH

EDUCATIONISTS and Ministry of Human Resource Development have observed that many of the central and state universities have not been provided with minimum level of infrastructure for the maintenance of quality and standard of education. They have found that improvement in higher education is necessary and pointed out that it is essential to select only those students who eagerly want to join special courses in which they have an interest, or have high motivation as well as high grades in their previous examinations. There is also a need to control wastage and stagnation in the field of higher education.

In addition to these, there were some internal reasons, like Central Universities were not representing students from other states in sufficient number. It was also observed that in a temptation of getting admission through academic indices, some students were submitting forged marksheets. It was difficult to select students in the absence of any national norm to ascertain the reliability of academic indices as a valid instrument for admissions.

To overcome all these deficiencies, the Academic Council of Banaras Hindu University on the recommendation of UGC started entrance tests in the faculties at graduate and post-graduate levels. An answer was needed to the question, whether students admitted through entrance tests were actually fulfilling the objectives of B.H.U. or not? It was necessary to get an answer to this question. Still more important was to know about the reliability and validity of the instrument through which the students were selected.

### **Objectives of the Study**

The study focussed at achieving the following specific objectives:

1. To study the reliability of the entrance tests used for admissions in various departments/faculties in terms of their (a) internal consistency, and (b) true variance of the scores.
2. To study the validity of the entrance tests used for admissions in terms of their (a) suitability for measuring students' previous learning, and (b) suitability for predicting students' future performance in courses pursued in B.H.U.
3. To study the relative effectiveness of the components of the entrance tests in predicting future performance of admitted students in the courses pursued in B.H.U.
4. To study the relative effectiveness of the entrance tests and the academic indices for predicting future performance in the courses pursued by students at B.H.U.

### **Subsidiary Objectives**

The following subsidiary objectives were set for the study:

1. To compare the means of the merit indices of different categories of students of the five faculties for the three consecutive years 1987, 1988 and 1989 for (a) quota students and general students, (b) general and weightage students, (c) boys and girls, (d) students of Mathematics and Biology groups, and (e) students of Arts and Social Sciences groups.
2. To compare the significant difference between means of marks on entrance tests for the faculties of Science, Arts, Education, Commerce and Law for the years 1987, 1988 and 1989.

### **Population and Coverage**

The study covered the population of the non-admitted and admitted students of the faculties of Arts, Science, Commerce, Education and Law for the years 1987, 1988 and 1989 at graduate level only.

### **Source of Data**

Data are collected from the University Examination Cell, office of the Controller of Examinations and from the office of different concerning faculties of B.H.U.

### Analysis of Data

To get reliability and validity of the tests, the following procedures for analysis of the data were adopted.

1. To get the internal consistency and variance of entrance tests, Kuder Richardson Formula-21 was used followed by variance estimate of the population
2. To get the validity of the test, inter-correlations between dependent and independent variables were obtained by Pearson's Product Moment Correlation Method, Multiple Correlation and Regression Prediction, Analysis of Variance and Critical Ratio were computed to find out the significant results.

### Findings

1. Reliability of all the entrance tests are high.
2. Most of the frequency polygons are skewed and frequencies are clustered below the actual means of the distributions.
3. Entrance test marks are found to measure previous achievements significantly except in faculties of Law and Education for the year 1987.
4. Previous qualifying course marks also appeared as significant predictor of future performance of students except in Faculty of Science for the year 1987 and Faculty of Law for the years 1987 and 1988.
5. First component of the entrance tests has significant relationship with future performance of the students except in Faculty of Science for the year 1987.
6. The second component of the entrance tests also has significant relationship with future performance except in the year 1988 for the Faculty of Science.
7. Total marks on entrance tests have significant relationship with future performance except in Faculty of Law for the years 1988 and 1989.
8. There is no significant difference in correlation coefficients for the first and second components for the prediction of future performance except in the year 1989 in Faculty of Science.
9. Significant difference is not obtained between the correlation coefficients of entrance tests and previous qualifying course marks for the prediction of first years marks except in Faculty of Arts for the year 1987 and commerce for the year 1989.

10. The students who are admitted without consideration of any quota are significantly higher in performance than those who got admitted under some quota.
11. Significant difference is obtained between those students who got admission due to weightage for being students of B.H.U. and those who were admitted without it, in Arts for all the three years, Commerce for the year 1988 and Education for the year 1989.
12. Significant differences are obtained in the marks of entrance tests between the groups of boy and girl students except in faculties of Science and Arts for the year 1987 and 1989, in Faculty of Law for the years 1988 and 1989 and in Faculty of Education for all the three years.
13. Biology groups students are significantly higher on entrance test marks than Mathematics students in the year 1987.
14. In Faculty of Arts, students are significantly lower on entrance test marks.
15. Significant difference is also obtained between the admitted groups for the years 1987, 1988 and 1989.
16. Significant differences is obtained between the admitted students of different faculties in the entrance test marks.
17. Combination of previous course marks and marks on the entrance tests significantly predicts the future performance of students in the multiple correlation analysis.
18. Contributions of both variables marks on entrance tests and previous qualifying course marks are approximately equal in prediction of future performance of students.
19. Weightage of ten marks of B.H.U. students in the marks of entrance tests seldom increases the correlation coefficients with future performance.
20. Combination of the two components of entrance tests increases the correlation coefficients.

### **Discussion**

The findings of the present study are quite interesting. These findings clearly indicate some sort of trend, although, it was a novel investigation in the field of selection of candidates for different faculties. B.H.U. had a long tradition of selection tests in the institutes of Medicine, Technology, Agriculture and Management. The findings of this research clearly show that for the entrance tests introduced in other faculties in the year 1987 this new attempt has been

quite successful. However, the reserach has not reached that sort of sophistication which is perceptible in foreign countries. But it shows a healthy trend that in the coming years these entrance tests will be able to stand on a very firm footing. In selection of candidates in India as well as abroad cognitive and non-cognitive variables are invariably used. Cognitive variables such as scholastic aptitude, intelligence and ability tests have to be a better predictor of future performance than non-cognitive variables such as personality tests, socio-economic status and others. Here, in the present context, items on general awareness to some extent fill up the gap of intelligence test, but it seems desirable that intelligence testing should, some-how or other, find a place in selection tests. It may not be taken as a separate test, but it may form a component of the selection device.

The findings reveal that results in later years have shown gradual improvement in the case of reliability as well as validity.

In most cases, the frequency polygons have shown absence of normal characteristics and have been found to contain skewness and kurtosis. Clustering of scores on either ends of the normal group curve is an indicator of the difficulties inherent in the selection procedure. Either the tests are very easy as in the case of Faculty of Law or the tests are very difficult as in case of faculties of Science and Commerce. These results show that there is a need for improvement in framing of items for the entrance tests in future.

An interesting point that has emerged from the analysis of the data of the entrance tests used in different faculties in the years 1987, 1988 and 1989 is that entrance test marks have proved to be a better predictor of future performance than previous qualifying course marks. This finding proves the relevance of the introduction of the selection tests. But it does not mean that the importance of previous qualifying course marks should be totally neglected. The findings of the study reveal that entrance test marks in combination with previous qualifying course marks have proved to be a better predictor than the entrance test marks or previous qualifying course marks taken independently. So, in future, in the opinion of the researcher, both, previous qualifying marks and entrance test marks, may jointly be considered for forming the selection device. But at the same time this procedure will present some difficulties. The process will become once again, tedious. Secondly, in the absence of national norms, pooling of the previous qualifying course marks on the same ground will again present difficulties.

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# **An Investigation of Piaget's Formal Research in Science among a Section of Indian School Students**

MALATHI RAJAGOPALAN

SCIENCE and science education have shown spectacular growth in the last few decades changing the entire prospect for the human species. Scientific problem-solving or hypothetico-deductive thinking is considered to be the basis of all the wonders of science and technology. In India, science is taught to all children up to Class X. Though the subject becomes optional thereafter, large number of pupils choose the science group at the higher levels. Yet there seems to be a gap between the pupils' potential in thinking and what they achieve at the end of the schooling. This leads to several questions such as: Does schooling promote effective thinking? Do our pupils realise their potential in cognitive development? Do they develop, by the end of their study of science in school, Formal Operational Thinking (or Formal Reasoning) as enunciated by Jean Piaget?

The present study investigates the Formal Reasoning of school pupils and also explores the relationships between Formal Reasoning and aspects like IQ, gender, socio-economic status, medium of instruction, age and class (or standard).

According to Piaget, cognitive development takes place in identifiable hierarchical stages; the sensory-motor, the pre-operational, the concrete operational and the formal operational. Piaget proposes the presence of certain cognitive structures at each stage and the improvement of these logicomathematical structures in subsequent stages. The presence of these structures is purely hypothetical and cannot be verified directly. It can, however, be verified indirectly by testing for the attainment of a few concepts or schemata whose development depends on these structures. Piaget and Inhelder discuss eight such 'concepts or schemata' in understanding the development of Formal Reasoning. These schemata are used in this study for the preparation of a tool for testing Formal reasoning.

### **Objectives of the Study**

The main objectives of the study were:

1. To prepare a paper-and-pencil type test of Formal Reasoning in Science suitable for group administration among Indian school pupils.
2. To test the level of Formal Reasoning in a given individual.
3. To identify the structural components of Formal Reasoning.
4. To investigate the relationship between Formal Reasoning and variables like Age, Grade, IQ, Gender, Socio-economic Status and Medium of Instruction and to represent the relationships through a casual or path model.

### **Methodology**

A Test of Formal Reasoning in Science (In English and Tamil) was devised for group administration by using ten schemata of thought of which eight were the formal operational schemata of Inhelder and Piaget. These operational schemata or concepts are special mental operations (logical and, in some cases, mathematical) which indicate the presence of integrated cognitive structures of formal operational thinking. Test items based on these concepts were prepared and the concurrent validity established using Arlin's Test Formal Reasoning. The reliability of the test was established using the formula K-R 20 and coefficient alpha. The test was used along with Cattell's non-verbal test for Intelligence and a personal data sheet.

The sample for the main study consisted of 378 pupils was drawn from Classes VIII, IX, X, XI and XII covering the age-group 11 to 17 years using stratified dimensional sampling. The sample was stratified on the basis of the grade with assured representation for the range of values of each variable.

The analysis of the data involved the classification of the pupils into five levels of Formal Reasoning, the testing of various hypotheses as well as the validation of the conceptualised path model for Formal Reasoning.

### **Analysis of Data and Hypotheses Testing**

The entire sample was classified into five groups on the basis of the total score to indicate the level of attainment of Formal Reasoning. It appears that only 5 per cent of the pupils are fully capable of Formal Reasoning and another 11 per cent have entered the stage. The remaining 84 per cent are perhaps in the transition stage between Concrete and Formal Reasoning.

## Hypotheses

### *H1: The five Formal Reasoning groups differ in their Operational Schemes.*

The presence of the ten 'concepts' or 'schemata' was tested for and stepwise discriminant analysis used to find the discriminating power of each of the concepts among the five levels of Formal Reasoning. All the ten concepts were found to have discriminating power when judged by the criterion 'F-to-enter'. The concepts were ranked according to their discriminating power.

One can conclude that the operational schemata do discriminate among the Formal Reasoning groups and that all the five assigned groups are distinguishable.

### *H2: Formal Reasoning has a unitary factor structure.*

Confirmatory factor analysis was used to understand the factor structure underlying Formal Reasoning. The principal components analysis yielded three factors having eigen values greater than one. This implies that Formal Reasoning is not a unitary ability. But the principal component which accounts for about 40 per cent of the variance seems to be the most significant component related to Formal Reasoning.

Borrowing the term 'operativity' from Lunzer, the three factors and their corresponding schemata based on factor loading can be presented as:

<i>Factor</i>	<i>Schemata/Concepts</i>	<i>Factor Loading</i>
Formal Operativity I (Transformational- Combinatorial Operation)	Frame of Reference	0.86
	Combinations	0.85
	Probability	0.62
Formal Operativity II (Conservation- Compensation operation)	Multiple Compensation	0.63
	Form of Conservation	
	beyond Verification	0.60
	Mechanical Equilibrium	0.59
Formal Operativity III (Relational-causal operation)	Proportional Reasoning	0.46
	Correlation	0.42
	Inductive-deductive Reasoning	0.86
	Hypothetical Reasoning	0.62

It is difficult to interpret these three factors meaningfully within the purview of Piaget's theory. The investigation suggests that Formal Reasoning is not a unitary ability.

### *H3: Formal Reasoning is independent of IQ, age, gender, medium of instruction, grade (or class) and socio-economic status.*

Multiple Regression gave a multiple R value of 0.72 with a highly significant  $F=67.5$  showing a correlation of the independent variables with Formal



Reasoning. The standard regression coefficients or beta weights came out as follows:

<i>Variable</i>	<i>Beta Weight</i>	<i>Level of Significance</i>
IQ	0.52	0 0005
Gender	0.19	0 0005
Socio-economic Status	0.13	0 02
Grade	0.12	0.02
Medium of Instruction	0.03	insignificant
Age	-0.01	insignificant

To test the significance of the difference between the means of various subgroups, t-test was used. It showed that all the four socio-economic status groups, both the medium-of-instruction groups and both the sexes differ significantly. Boys performed better than girls and the English-medium pupils better than the Tamil-medium ones. Higher socio-economic status led to better performance.

The successive age-groups or the pupils in successive grades did not show significant differences in performance. But the differences became significant when larger differences in age or grade were considered. Thus, 16 and 17-year-olds performed significantly better than 12 and 13-year-olds. Similarly, then Class XII pupils do significantly better than, say, Class VIII or IX.

Pupils studying through English medium did show better ability in Formal Reasoning than those under Tamil medium, as judged by the significance of the t-test. However, when the effects of the other independent variables like IQ, Socio-economic Status, etc., were controlled in the multiple regression analysis, the regression coefficient of Medium of Instruction was found to be insignificant. Hence, it can be concluded that the Medium as such does not influence the development of Formal Reasoning and the better performance of the pupils of English medium maybe due to higher IQ and better interacting experiences at home.

On the whole the analysis reveals that IQ and gender contribute significantly to Formal Reasoning.

### **Validation of the Conceptualised Path Model**

A basic path model was conceptualised earlier based on the expected relationships. After the multiple regression analysis it was validated with a few changes. The beta weights were used in a path diagram showing pictorially the relationship between Formal Reasoning and the other variables. The

overall impact of each variable including the indirect effect on Formal Reasoning is shown by the cumulative path coefficients: Age — 0.144; Gender — 0.29; Socio-economic Status — 0.38 and IQ — 0.54.

*H4. Formal Reasoning in Science is related to academic achievement in Mathematics.*

*H5. Formal Reasoning in Science is related to academic achievement in Physical Science.*

Pearson's product-moment correlation was calculated to test these two hypotheses. The Mathematics and Science scores yielded correlations of 0.47 and 0.36 respectively with the score in the Formal Reasoning test, both significant at the 0.001 level. But both correlations were lower than that between IQ and Formal Reasoning.

### **Summary of Major Outcomes and Conclusions**

1. The test of Formal Reasoning that has been devised (In English and Tamil) is useful in identifying the pupils' Formal Reasoning in five levels.
2. The ten Operational Schemata included in the test significantly discriminate among the five levels of Formal Reasoning.
3. Formal Reasoning is not unitary in nature and has three independent cognitive dimensions or factors underlying it.
4. Formal Reasoning is significantly correlated to IQ and academic achievement in Mathematics and Physical Science.
5. Socio-economic status and gender seem to influence Formal Reasoning with greater significance compared to other aspects like age, grade and medium of instruction.
6. The Formal Reasoning ability of boys is higher than that of girls.
7. A higher level of Socio-economic Status leads to higher score in Formal Reasoning.
8. The Medium of Instruction does not influence the development of Formal Reasoning.

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# **A Study of Personality Traits, Psychogenic Needs and Academic Achievements of Rural and Urban Female Adolescent Students in Relation to their Cognitive Style**

GULAM QADIR SHEIKH

REALIZING the need of special attention to the education of women, the National Education Policy 1986 accepted education for women's equality, as a vital component of overall strategy of securing equity and social justice in education. *Inter alia*, it emphasizes the provision of special support services and removal of factors which result in discrimination against women at all levels of education. It also asserts that women's studies is a critical input to promote better understanding of women's contribution to social processes within social, technological, and environmental changes. Since 1986, the topic of women education has been treated as a special area of research. The growth of women's studies during the last decade, its acceptance in the institutions of higher education by the University Grants Commission and bodies like ICSSR, ICHR, and NCERT, have resulted in generating a new understanding and analysis of women's problems. However, there is a dearth of studies which deal with psychological aspects of adolescent girls such as personality, psychogenic needs, cognitive style and academic achievements. Particularly, there is absence of research concerning adolescent girls residing in rural and urban areas. This is an indicator to the fact that such investigations need urgent attention of the researchers. In view of this, the present study was conducted to explore the personality traits, psychogenic needs and academic achievements of female adolescent students with reference to rural-urban residential background and cognitive style

## **Method**

The present study was conducted through descriptive survey method of research.

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Doctoral thesis submitted to Himachal Pradesh University (1993).

### **Variate Structure**

Residential background and cognitive style were considered as independent variables and 14 personality traits, 10 psychogenic needs and overall academic achievements were regulated as dependent variables.

### **Tools**

The following tools were used for data collection:

1. Urdu version of HSPQ of Cattell.
2. Urdu version of Meenakshi Personality Inventory.
3. Group Embedded Figures Test (GEPT) by Witkin *et. al.*

### **The Research Design**

The present study was conducted within 2 x 2 factorial designs, in which residential background was designated as 'A' and two levels of it as A<sub>1</sub> (rural) and A<sub>2</sub> (urban). Cognitive style, the second factor was designated as 'B' and its two levels as B<sub>1</sub> and B<sub>2</sub> corresponding to field-independent and field-dependent respectively. Each cell of the design had 40 subjects.

### **Classification of Subject**

The group of field-independent and field-dependent female adolescent students were formed on the basis of M+ISD formula. The subjects who had M+ISD or above on the distribution of cognitive style scores were regarded as belonging to FI cognitive style, and those subjects who scored M-ISD were treated as FD cognitive style.

### **Statistical Techniques Used**

For testing the hypothesise of the study and drawing the interference from sample values to population, the two-way analysis variance techniques was employed. In case of significant 'F' ratio for interaction Tukey Test was used.

### **Conclusion**

Discussion of the findings led to the following conclusions:

1. Female adolescents belonging to rural and urban residential background do not differ significantly on 14 personality traits viz. 'A' (reserved vs warmhearted); 'B' (less intelligent vs more intelligent); 'C' (affected by feelings vs emotionally stable); 'D' (undemonstrative vs equalltable); 'E' (obedient vs assertive); 'F' (sober Vs enthusiastic); 'G' (disregards rules vs contentious); 'H' (shy vs adventurous); 'I' (tough-minded vs tender minded); 'J' (zestful vs

circumspect individualism); 'Q<sub>1</sub>' (self-assured vs apprehensive) 'Q<sub>2</sub>' (group dependent vs self-sufficient); 'Q<sub>3</sub>' (uncontrolled vs controlled); 'Q<sub>4</sub>' (relaxed vs tense).

2. Female adolescents with field-independent and field-dependent cognitive styles do not differ significantly on personality traits except on factor 'B' (less intelligent vs more intelligent) and factor 'Q<sub>3</sub>' (uncontrolled vs controlled).

3. There is no interaction between residential background (rural/urban) and cognitive style of female adolescent students with regard to 13 personality traits. However, in case of factor 'Q<sub>4</sub>' (relaxed vs tense), there is significant interaction between residential background and cognitive style. Urban field-independent female adolescent students are significantly more 'tense' than their rural field-independent counterparts. But rural and urban field-dependent female adolescent students are more or less similar on factor 'Q<sub>4</sub>'.

4. Female adolescent students belonging to rural and urban residential background do not differ significantly on ten psychogenic needs viz. n-achievement; n-exhibition; n-autonomy; n-affiliation; n-succorance; n-dominance; n-abasement; n-nurturance; n-endurance and n-aggression.

5. Field-independent and field-dependent adolescent students differ significantly from each other in case of two psychogenic needs, n-autonomy and n-affiliation. Further, field-dependent female adolescent students have higher level of n-affiliation than their field-independent counterparts, on the other hand, field-independent female adolescents possess higher level of n-autonomy than field-dependent adolescents.

6. There is no significant interaction between residential background and cognitive style with respect to the psychogenic needs viz. n-achievement, n-exhibition, n-autonomy, n-affiliation, n-succorance, n-dominance, n-abasement, n-nurturance, n-endurance, and n-aggression.

7. There is no significant difference in the mean academic achievement of rural and urban female adolescent students.

8. Female adolescent students with field-independent and field-dependent cognitive styles differ significantly with respect to their academic achievement. Field-independent female adolescent students achieve higher scores than their field-dependent counterparts.

9. There is no significant interaction between residential background and cognitive style of female adolescents with respect to their academic achievement.

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# **A Study of Relative Effectiveness of Some Information Processing Models of Teaching on Mental Processes and Attitude towards Science**

**NARESH KUMAR GUPTA**

THOUGH inseparable, the process of teaching is different from the process of learning. The shift in emphasis from teaching to learning has known varying shades of combinations of the two activities that go on simultaneously to achieve the goals of this enterprise. It is now increasingly felt that none alone can achieve the ends. The growing concern for evolving appropriate strategy or strategies has become all the more in the light of the expanding frontiers of knowledge coupled with changed needs and competencies of manpower. Theories of learning and development are not adequate for the development of a theory or theories of teaching. A path has been set for human processing taking cues from the computer application for processing in modern ways.

In this light education also needs to gear up to match the changing needs. Teaching needs to be directed towards the development of individuals and also a source of continuous refinement in the ability of a teacher to deliver the goods. There is no single best way to teach and thus, different teaching strategies are required to realize different instructional goals. Models of teaching as strategies or as a discernible approach need to be incorporated in the practice of teaching.

During the last two decades, many new methods of teaching and training have been developed, tested, modified and adapted to different kinds of learning situations. Some of these have become very popular and are effectively used. Some methods are intelligent adaptations of others, some are very simple while some others are sophisticated needing thorough preparations on the part of a teacher. In this light models of teaching as approach to

classroom transactions has become far more important. According to Joyce, Weil and Showers (1992), "To provide all-round developments, we need to design suitable instructional strategies which help our students grow emotionally, physically, socially and intellectually. We need to know how to modify their behaviour so that they function effectively and efficiently in changing the society". Hence, models of teaching can be an answer.

A model of teaching seeks the systematical exploration of interaction among educational purposes, pedagogical strategies, curricular design and materials; social and psychological theories (Joyce and others, 1990). A model of teaching is characterized by a well defined and variable theory, specification of intended and unintended objectives, pedagogical syntax expressed in terms of well sequenced steps, explicitly described reactions of teachers and description of classroom support system (Passi, 1991). Models of teaching provide alternative instructional channels within our existing school system and classroom structure. This approach relies primarily on the human beings for their success rather than on machines and technological devices, which a developing country like ours can hardly afford.

For learners, on the other hand, specific mental processes like reasoning, scientific creativity, problem awareness, thinking particularly along with a positive set of attitudes will go a long way in effective and efficient information processing which is the stepping stone for achieving the needed learner behaviour. Information processing is an important concern, component and requirement of pedagogy effective cognitive, affective and psycho-motor processes. Researchers have shown that information processing can be studied, manipulated, enhanced and even taught through formal system.

### **The Problem**

Models of teaching is one of the latest but the least investigated area of innovations in instructional processes or teacher effectiveness. In a rapidly changing scenario there is a strong urge to refine and improve teaching strategies and instructional techniques to realize full potentiality of learners. One will agree with Joyce (1990) that there is a need for research which examines different dimensions of instructional and nurturant effects of models of teaching on individuals.

The relative efficacy of models of teaching will have to be investigated seriously. Concept attainment model and inductive thinking model have generally been applied to teaching of social sciences while inquiry training model to teaching of sciences at middle school stage. On the basis of the results obtained in a few studies like the one by the present investigator Gupta (1988), wherein inductive thinking model was found to be more effective than

concept attainment model on achievement and none of the two could bring significant change in self-concept, it is evident that comparative studies on models of teaching can also be attempted that may help in improvement of classroom practices. With the changed requirement of mental competencies in the context of models of teaching and human resource development, it was felt that the overlapping areas and goals of these models could be studied through their inter-model comparisons. Hence, differential effectiveness of concept attainment model, inductive thinking model and inquiry training model on mental processes and attitude towards science was studied through this piece of work with the help of teaching science to Class IX.

### Main Objectives

1. To design and develop instructional plans for teaching selected units in science from amongst the prescribed course of study at Class IX stage based on:
  - (i) Burner's Concept Attainment Model,
  - (ii) Hilda Taba's Inductive Thinking Model, and
  - (iii) Suchman's Inquiry Training Model of Teaching.
2. To study individual effectiveness of teaching through concept attainment model, inductive thinking model as well as inquiry training model on:
  - (i) Development of pupil's mental processes:
    - (a) Development of reasoning ability.
    - (b) Fostering scientific creativity.
    - (c) Fostering ability to see the problems.
    - (d) Enhancing inquisitiveness ability.
    - (e) Growth in persistency.
  - (ii) Development of favourable attitude of the students towards science.
3. To find the relative effectiveness of teaching through concept attainment model, Inductive thinking model and inquiry training model in
  - (i) Developing mental processes of the students:
    - (a) Development of reasoning ability.
    - (b) Fostering scientific creativity.
    - (c) Fostering ability to see the problems.



- (d) Enhancing inquisitiveness ability.
- (e) Growth in persistency.
- (ii) Development of favourable attitude of the students towards science.

### **Sample**

A purposive sample of 140 students in the form of three non-equivalent intact sections of Class IX in the same government senior secondary school of Delhi drawn with the help of incidental sampling technique has been used as the sample of the study.

### **Tools Used**

Following standardized tools have been used to measure dependent variables at pre- and post-test stage and the covariate.

1. The Group General Mental Ability Test by S. Jalota was used to measure general mental ability — a co-variate.
2. Reasoning Ability Test (RAT) by K. Bayati was used to measure reasoning.
3. Verbal Test of Scientific Creativity by V.P. Sharma and J.P. Shukla was used for measurement of scientific creativity of the subjects.
4. Part test of Passi Tests of Creativity (verbal and non-verbal) was used to measure seeing the problems, inquisitiveness and persistency among the students.
5. Science Attitude Scale by Avinash Grewal was used for assessment of attitude of the students towards science.

### **Procedure**

Quasi-experimental method was employed for the study in a natural setting with pre-test and post-test parallel group design.

### **Findings**

1. Concept attainment model of teaching was found effective in developing reasoning ability, scientific creativity as well as fostering favourable attitude of the students towards science whereas it could not foster inquisitiveness, persistency or problem awareness among them.
2. Inductive thinking model was found to promote reasoning ability, scientific creativity, problem awareness ability as well as attitude of the

students towards science favourable but could not bring significant enhancement in inquisitiveness or persistency ability among them.

3. Inquiry training model of teaching was found effective in developing reasoning ability, scientific creativity, problem awareness ability and attitude of the students towards science favourably. However, this model could not bring significant gain in inquisitiveness or persistency.

4. Concept attainment model, inductive thinking model or inquiry training model did not differ in effectiveness in terms of enhancing reasoning ability or scientific creativity.

5. Inductive thinking model and inquiry training model of teaching have been rated better than concept attainment model in fostering problem awareness ability. However, inductive thinking model and inquiry training model did not differ in fostering seeing the problems ability.

6. Concept attainment model, inductive thinking model or inquiry training model did not differ in promoting attitude of the students towards science.

### **Conclusion**

On the basis of the study it can be said that all the three information processing models studied — concept attainment model, inductive thinking model as well as inquiry training model — can develop reasoning ability, scientific creativity and attitude of the students positively towards science to the same degree through teaching of science. Thus, models of teaching need to be introduced for teaching science to bring desirable changes in students' mental processes and attitude towards science. Science for All and Scientific Literacy goals can also be achieved effectively through models of teaching as they are alternate to learning by doing or even child-centred approach.

None of the three models of teaching studied can be said to be effective in enhancing inquisitiveness among students and hence have failed to detect students working holistically and painstakingly. These models could thus not be used to bring such an improvement. There is a need to create several sided models which can act and help to isolate components of competence to be developed among students.

Inductive thinking model and inquiry training model are more effective than concept attainment model, in fostering problem awareness ability among students whereas the former two are equally effective among themselves. Thus, inductive thinking model and inquiry training model can be effectively used to teach science as problem awareness ability, if developed, leads to development of scientific temper. Moreover, methodology involved in teaching through these models, i.e. formulation of objectives, sequencing,

hypotheses formulation, testing and arriving at results and the like, helps in development of desirable behaviour changes in students.

Models of teaching are easily applicable in Indian classrooms and create a healthy teaching-learning environment. Thus, the study can be said to have implications for science education, teachers, teacher educators, administrators, curriculum planners, research fellows as well as students and it establishes that models of teaching have a significant role to bring about an enrichment in teaching process

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## ***Book Reviews***

### **Educational Psychology**

*Edited by* JYOTINDRA MOHAN

Wiley Eastern, New Delhi, 1993, pp 384, Hardbound, Price. Rs 350

PSYCHOLOGY has been contributing to educational practice in a number of areas by providing knowledge base for the principles of learning and teaching, child development, individual differences, motivation, measurement and evaluation mental health and schooling process etc. Also, the field has been enriched by the contributions from scholars in allied disciplines. In the Indian context considerable work has been done in this field by various institutions of higher education, training and research. Attempts have also been made by agencies like ICSSR, NCERT and NIEPA to make the related data and information available to consumers through various publications which are easily accessible to the potential users. In addition, individual researchers have published a number of volumes pertaining to the field of educational psychology and several Indian journals are publishing researches which provide relevant material to enable one to develop an Indian perspective on various themes.

The importance of the Indian data base, concepts and strategies is crucial for Indian students of educational psychology and hardly needs any elaboration. The socio-economic and institutional context, governmental policies and cultural as well as sub-cultural variations in the organization of teaching-learning process in India demand sensitivity on the part of Indian scholars and researchers. Considering the oral tradition, aspects of Indian child rearing and socialization practices, high degree of dependence, social constructs of self, socio-economic disparities prevailing in society, variety in educational institutions at different levels, specific developmental norms in the Indian context, linguistic variations and related issues and educational practices pertaining to formal and non-formal sectors of education compel us to go beyond the Euro-American frame of thinking. Concerns of this kind are assuming increasingly greater importance as the nation realizes the significance of local as well as global issues simultaneously.

Against this background publication of a volume on educational psychology in India deserves special attention. The present volume edited by Jitendra Mohan contains 18 chapters and two chapter-like appendices contributed by 16 scholars of psychology and education. The inner flap of the book informs that "the chapters cover undergraduate and post-graduate courses in Educational Psychology, provide latest research references and a wholesome profile of the emerging frontiers in the field". As such the book claims to be a textbook useful for the Indian universities and colleges and raises expectations in the reader that he or she will be exposed to a new perspective on this growing field of psychology which is more pertinent to the Indian social reality.

The contributions to the present volume address a variety of themes covering traditional topics (e.g., individual differences, development, learning, motivation, evaluation) as well as topics of special interest to Indian students (e.g., educational organization, deprived children, academic achievement and failure). The treatment of respective topics by contributors are quite varied. Some have reviewed the area, some have given merely a synoptic view of the field, some have followed the textbook style and some have written in the style of essay. This stylistic variety has resulted in different degrees of elaboration and analysis of the topics and sub-topics in respective chapters. In fact all the chapters have followed different organization enriching the reader's vision and understanding to different degrees in different ways. The chapters thus present different parts of a whole but do not enable the reader to have a coherent and organized picture of the field.

The introduction to the volume by the editor characterizes educational psychology in terms of a 'body of knowledge and principles' related to the teaching learning process situated in the classroom setting. Finally, it briefly enumerates the aims and scope of educational psychology. While this chapter does list the different aspects of traditional educational psychology it leaves the range of growing concerns of contemporary educational psychology untouched. Also, it does not provide any indication about the contributions to the volume which is ordinarily expected from an introductory chapter in edited volumes of this kind. The chapter includes six references which are not referred to in the text. Perhaps the books listed include recommended readings. As such one expects it to be more comprehensive and inclusive of recent publications. Some of the tasks of an introductory chapter are performed by Pangotra's contribution on development of educational psychology. It begins by analysis of early developments in the Western world. This is followed by delineating the meaning, objectives and contents of educational psychology. The chapter is written in a simple style and utilizes the standard textbooks of the 70s for articulation of the issues. Lack of any reference to Indian views or perspective on the theme is surprising.

Malhotra has discussed the various domains of individual differences (e.g., intelligence, creativity, school achievement, special aptitudes, talents, personality, values, cognitive style) and their determinants. Psychological testing is explained and some good and well-known tests of intelligence, aptitude and personality are described. Finally, the practical implications of testing are highlighted. The treatment of these themes is introductory and familiarizes the reader with the basic concepts in a lucid manner. The next chapter by Upmanu elaborates the theme of nature and assessment of personality. The authors have confined themselves to the trait approach as they perhaps, consider it more appropriate. Also, these two chapters overlap and repeat many sub-themes.

Development is the theme of the next chapter by Mohan which presents an outline of physical and motor development, intellectual development, memory, language development, social and emotional development and moral development. The exposition of various concepts introduces the reader to a range of issues discussed in the domain of developmental psychology. While the coverage is remarkable, its content is grounded in the development data base of Western societies which is difficult to use for characterizing the development of Indian children.

Chapters 7 and 8 deal with the conceptual foundations of learning which constitute a major part of educational psychology. Providing a synoptic view of the learning process, the authors expose the reader to the traditional theories of learning and its variables. The measure of learning given on pp. 144-45 is a very complex and broad spectrum formulation. In the absence of any elaboration of the same it is very difficult to appreciate its full significance. The learning theories covered have direct and indirect bearing on the course of learning in a variety of contexts. However, inclusion of work related to classroom learning would have certainly made this analysis more comprehensive. The same has received a lot of attention in recent years. Also, many new theoretical perspectives have emerged on 'instruction' process.

Gakhar's effort to bring into focus optimization of concept learning describes many early classic experimental studies performed by psychologists on concept formation. Also, it includes Gagne's and Ausubel's models which are more relevant to the educational context. Newer developments, however, have not received any attention.

The problem of exceptional children has been analyzed by Jitendra Mohan. After presenting current trends and issues the author has described the problems pertaining to children of the mentally retarded, delinquents and physically handicapped categories.

A short note on deprived children by L.B. Tripathi constitutes a separate chapter. It outlines the conceptual issues and suggests measures to help the deprived children. A more-detailed account of the same was desirable.

Aspects of academic achievements/failure, particularly its personality, intellectual, home environmental correlates, are discussed in Chapters 11 and 12 by Sehgal and Wadkar and Palsane. Teacher behaviour and teachers' effectiveness have been discussed at length by Mohan, Sehgal and Vasudeva in a comprehensive manner. Mohan has also written a chapter on student motivation. It describes many useful motivational concepts important in the learning process.

Use of behaviour modification techniques in the classroom setting has been effectively illustrated by Parameshwaran and Ravichandra. Their chapter deals with both the theory and practice of behaviour modification in very clear and authentic terms. Stress and its management has been described by Bhandari. Text anxiety, competition, success and failure have been analyzed. Dutt has presented an interesting conceptual analysis of mental health and has examined the role of school and family. The problem of educational institutions as organizations has been taken up by Parameshwaran in an excellent manner.

Evaluation and elementary statistics are described by Mohan and Joshi, respectively in the two appendices. The coverage of these chapters is adequate.

On the whole the present volume arouses more curiosity in the reader by helping him to acquaint himself with the basic aspects of educational psychology. While some of its chapters do respond to the Indian reality, many of them follow the traditional pattern. It is high time that we reorient our approach towards the teaching-learning process in a contextualized fashion, grounded in cultural practices.

The printing of the book is excellent. Except some stylistic problems and typographical errors it has been produced very well. Its price is relatively on the higher side which would render it less accessible to the Indian student community. It is hoped that the next edition of the book will be more balanced in its coverage and more sensitive to the Indian data base and issues.

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# Teacher Education and the Teacher

L.C. SINGH    P.C. SHARMA

Vikas Publishing House Pvt. Ltd., 1995, pp. 185 Price: Rs 250

NEVER before so much importance has been given to the teacher and teacher preparation in India as in the last couple of decades. For the first time, the Chattopadhyay Commission was appointed exclusively to examine the status of teachers and to make recommendations for raising the social and economic standing of teachers in the society. Following the publication of Baljit Singh's book entitled *Education as Investment* in the early sixties and the Education Commission Report (1966), education is not only increasingly being viewed as investment in human capital formation, but it is being considered a residual function of the society. There has also been a continuous effort to bring about qualitative improvement both in the pre-service and in-service teacher preparation methods, programmes and activities to suit the changing tasks and functions of the teacher in the ever-changing social, political and economic setting of the country. The first two decades after the independence had witnessed considerable quantitative expansion of teacher education but this had been largely independent of qualitative development in the field. Following the recommendations of the Mudaliar Commission on Secondary Education an attempt was made to improve and strengthen the in-service education of teachers with the establishment of the All India Council for Secondary Education and later on the Directorate of Extension Programmes for Secondary Education (DEPSE) which set up a large network of Extension Services Centres attached to several training colleges and departments of education in the universities to effect improvement in the quality and standard of school education. Even with the formation of the Department of Field Services in the National Council of Educational Research and Training the task of extension education has not been very productive.

In the backdrop of such experiences and also the ever-expanding demands made on teachers in the context of changing needs of the society, many innovations in the structure, organization, methods, programmes and activities, in other words, the curriculum and also the controlling authorities for teacher education have been worked out during the last two decades.



The present book surveys these various facets of teacher education and systematically documents the developments in the field. It analyses the context and mode of teacher preparation and examines the related issues with the help of ample statistical data and evidences. The book discusses the new curriculum, changed evaluation practices, admission procedures, recruitment policies and also the use and contribution of educational technology in teacher preparation. Unlike other available publications in the field, the book takes a comprehensive look at teacher preparation at four distinct levels — the pre-primary, primary and upper primary, secondary and higher secondary — both pre-service and in-service. Contributions made by NCERT, SCERTs, DIETs and the newly constituted National Council for Teacher Education (NCTE) are discussed and examined specifically to give credence to the importance given to teacher education today.

Completed in eight chapters the book covers most of the significant issues concerned with teacher education including the origin of contemporary teacher education, its salient features and the innovations taken up in the field. Indian books on teacher education are largely descriptive and in that respect the book under review is no different. The difference lies in its extent of coverage of the field and its strategies related with qualitative improvement of teacher education with support of concrete models of how research and educational technology can be helpful in making teacher education productive and useful. Another distinctive feature of the book is a chapter dealing with the modern viewpoint about the code of professional ethics of teachers, school management and administrators with special emphasis on teacher accountability, besides presenting the current thinking of policy makers at the national level.

The authors have made no mention of their own point of view on teacher education and their image of the teacher in presenting and discussing the developments in the field. But the manner in which the material is presented and dealt with indicate the authors' tilt towards teaching as a skill and teacher as a 'craftsman' who can use educational technologies when they state 'while formulating objectives of teacher education the emphasis should drastically shift from cognition to skill' (p. 37).

The book does not appear to have been written keeping in mind the syllabus of any particular university for any examination and, therefore, in the strict sense of the term, it may not be a textbook but the coverage of the book is such that it will be found useful by teacher educators, student teachers, educational administrators, researchers and all those concerned with preparation of teachers. The book is very informative. It helps one to know the latest thinking on various problems and issues related with teacher preparation and teacher's professional growth and development. The au-

## BOOK REVIEWS

thors deserve full complement for bringing out such a well thought-out and informative book on teacher education written in readable language and lucid style. A slightly more analytical presentation of the contents, however, could have added to the value of the book which comes from the authors who have spent their whole professional life in understanding, reflecting and resolving problems and issues related to the teacher and teacher preparation. The book will not only be a very valuable addition to the library but prove to be of immense help to all those who feel concerned about the teacher and teacher education and as such it needs to be included in the reading list that is must for all students and teachers who propose to specialize in the field of teacher education.

The book is nicely printed, the get-up is good and the publishers have done a good job to bring about a quality book on teacher education.

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